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Cover Picture

Troemner manufactured this "Tack, Nail, Screw Count Scale" in the early 1900s. The catalog reads as follows: *A very popular scale for packaging tacks, nails, screws, etc. The scale is furnished with a threaded beam and poise and scoop.*

Method of use: Count into the scoop the number you want to repeatedly pack, then screw out the beam poise on the beam until scale balances, then tighten the screw in poise. This will hold the poise at this position on the beam and all the packages will be of the same weight and count.

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Photos are best in 300 DPI Jpegs in a separate file with a maximum of 3 photos per Email.

Thomas Bourne, Scale-Maker and… Predecessor to Day & Millward

BY GREGG MOTTER & DIANA CRAWFORTH-HITCHINS

Introduction

The historical background for Day & Millward contains a wide assortment of products including scales, weighing machines, and weights – as one would expect – as well as fishing tackle, screw plates and dog & die stocks, along with sugar mills and brass & copper kitchen furniture. To properly understand their foundation, one needs to examine Thomas Bourne senior's scale-making business established in 1788 located in Birmingham, England.

By 1776, Birmingham was hailed as *'The First Manufacturing Town'* in the world. The city contained thousands of small workshops practicing a wide variety of specialized skills with skilled labor that delivered high levels of creativity and innovation. Birmingham is located 160 km (100 miles) north-west of London, and was able to grow industrially because of its location near iron and coal mines with water resources that ran throughout the year to power machinery until steam engines gradually came into use around 1800. Although it had poor transportation links, it was still able to produce iron and brass goods more economically than anywhere else in Britain, until Sheffield became equally efficient. As a result of these resources, merchants were selling finished goods as far away as the West Indies and other British colonies.

Thomas Bourne Starting Out - 1776 to 1800

Thomas Bourne paid £7 for an apprenticeship with the very competent steelyard-maker Thomas Beach on December 18, 1776 (aged 13) at 11 Digbeth[1]. An official apprenticeship was a rarity for a youth in Birmingham. During his apprenticeship, Bourne learned to make steelyards and beams as shown in Figure 1. In Birmingham, there was no Guild checking up on the status of apprentices and journeymen as was the case in London, but he most probably served the conventional seven years.

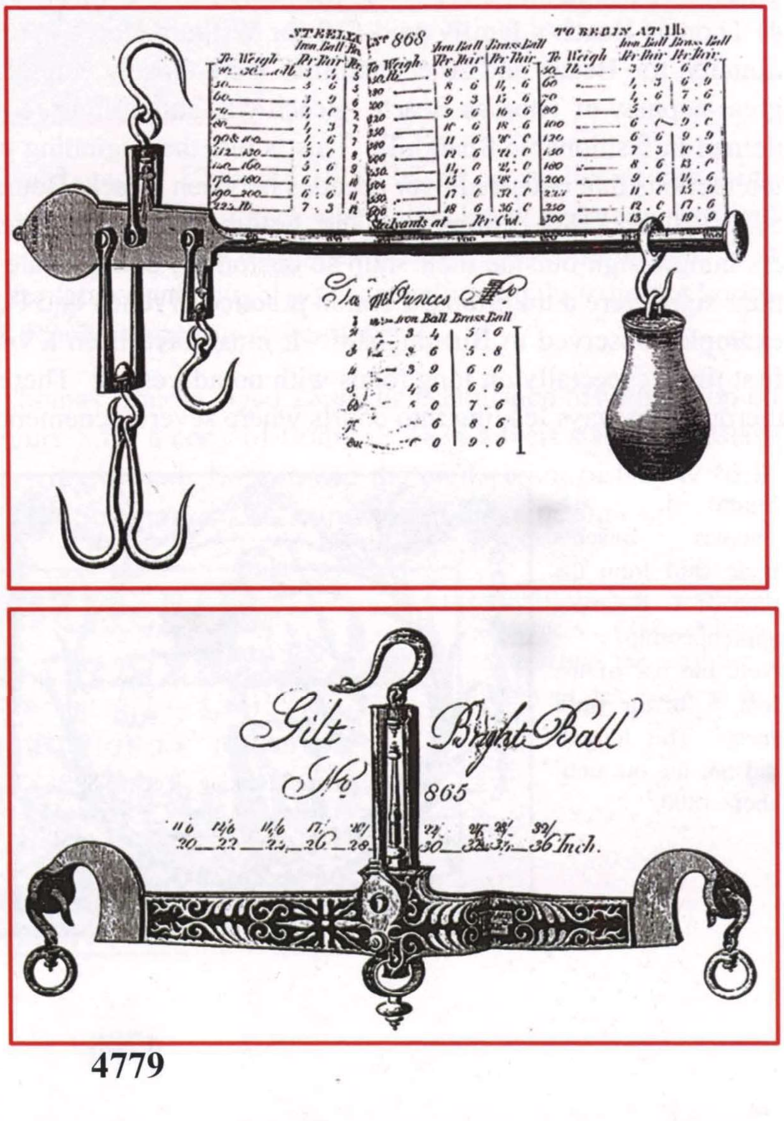
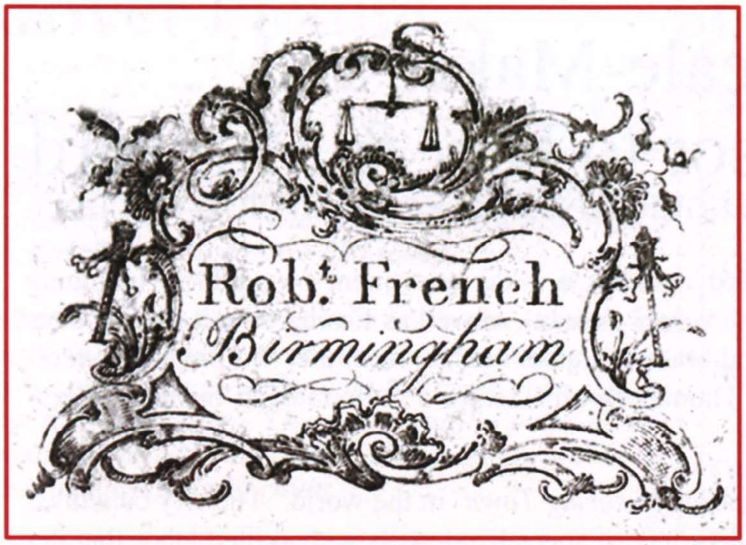


Figure 1. ➢➢ Traditional British steelyard and beam designs made by Beach at the time of Bourne's apprenticeship.[2] Ignore the crease on the right arm of the beam where the catalog was bound.



Robᵗ. French
Birmingham

Figure 2. ⮝⮝ Robert French's c1770 trade card in a japanned box for coin scales.

There are five notes worth mentioning here:

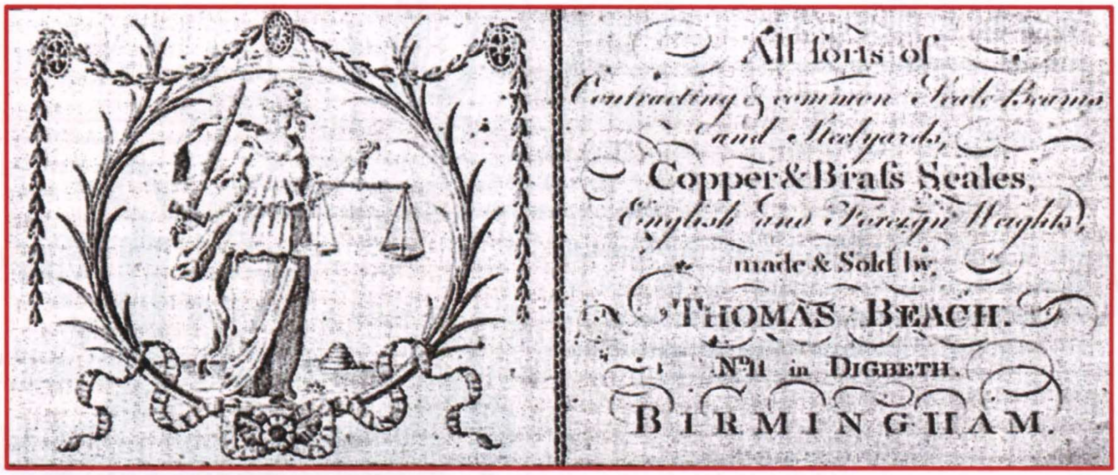
1) Thomas Beach was trained by Robert French, also in Birmingham. Robert French's probable shop sign was a pair of Scales as shown on his trade card. See Figure 2. Unfortunately, we have no records of who Robert French's master was or where he came from. A 1770 directory indicates French's workshop was located at 28 Digbeth, 17 doors from Thomas Beach.

2) Beach's craftsmanship was of the highest order. Examples of his work are preserved in the Avery Museum, and his patterns were used by Avery well into the 19th century.

3) Beach's shop sign was Blindfold Justice holding a pair of scales as shown on his trade card. See Figure 3. Thomas Beach is not in the 1770 directory. Seven years later he was working at an unnumbered house on Bullring. A trade label found in one of his folding gold balances indicated 11 Digbeth as his residence for many years. Beach laid the foundation to enable Avery's growth from a Birmingham concern at 11 Digbeth to a nationwide organization, and under Avery family successors, a worldwide organization.

4) Thomas Beach's family paid £10 for William Hall's apprenticeship to William Avery in 1833. Additionally, the Beach and Avery families were closely connected by intermarriages. Thomas Avery is the great-nephew of Thomas Beach. Beach was able to retire in 1793 at 48 years of age, and lived as a Gentleman in fashionable Sparkhill. This is just the beginning of numerous business transactions and family interactions that occurred over decades between Beach, Bourne, and Day & Millward with W & T Avery.

5) In 17th and 18th century England, before shops and houses were numbered in an orderly fashion, owners hung a sign outside their shop so customers could locate them. Trade signs, and trade cards showing their sign, were a traditional London practice. French and Beach trade cards and signs are among the few examples observed in Birmingham. It must have been a very trying experience to locate a shop for the first time, especially on long roads with no addresses! There were 142 houses fronting Digbeth, with numerous alleyways leading into courts where several tenements faced an open square.



All ſorts of
Contracting & common Scale Beams
and Steelyards,
Copper & Braſs Scales,
English and Foreign Weights,
made & Sold by
THOMAS BEACH.
Nº 11 in DIGBETH.
BIRMINGHAM.

Figure 3. ⮞⮞ Thomas Beach's trade card from the time of T. Bourne's apprenticeship. Note the use of the long S for the word *sorts*. This long S did not die out until about 1800.[3]

Thomas Bourne leased *property, land, buildings, and grounds located at 1 Mount Street* from Thomas Richardson from 1785 to 1789 providing himself a home and workshop. This date fits with the expected completion of his apprenticeship in 1784. The land, home, workshops and associated buildings were valuable, being sold in 1832 to Thomas Bourne's nephew for £350[4].

Thomas Bourne senior had a short partnership with a Mr. Court in 1788 in a workshop on Digbeth. From 1789 to 1799, Bourne worked alone on Digbeth engaged in the production of steelyards and beams. The exact location is unknown, but likely close to his master, Thomas Beach. See Figure 4. From about 1750 onwards there were at least 12 scale-makers along Digbeth, and in the little alleys behind Digbeth, along with an additional 40 within Birmingham proper!

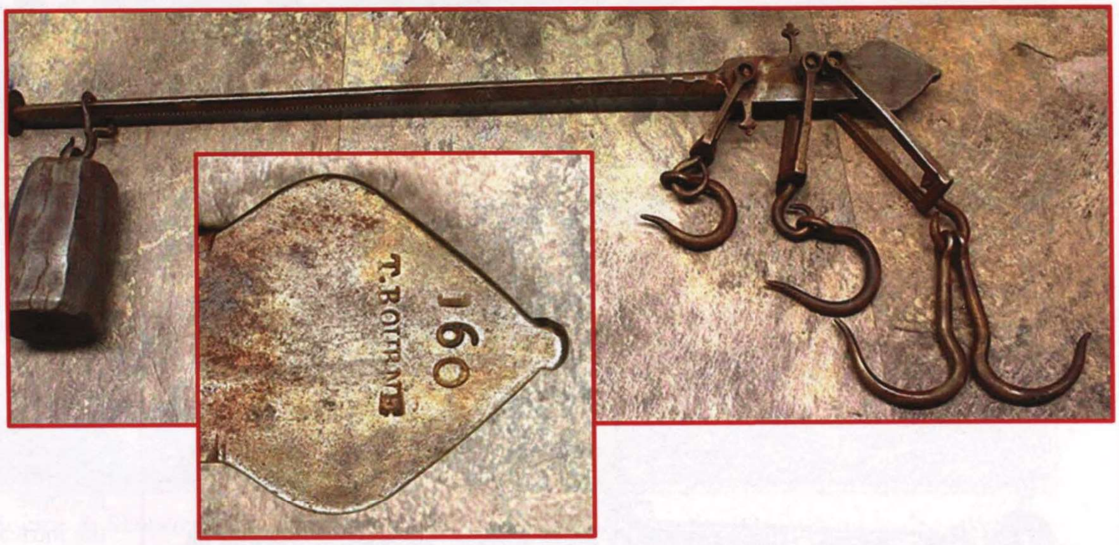
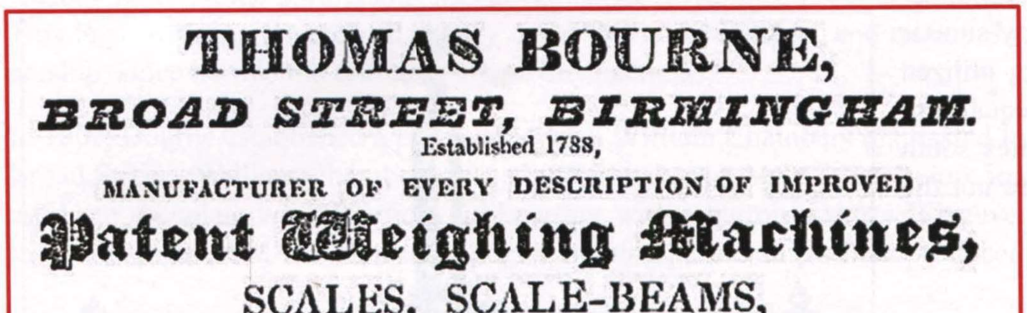


Figure 4. ➢➢ Early Thomas Bourne steelyard marked with a capacity of 4 cwt (448 lbs) and stamped with the model number 160.

The vast majority of the scale-makers thrived between 1700 and 1900, based on studies of surviving Wills. Their success was due to populations leaving rural villages where they knew everyone, bartered meat for fruit without weighing them, moved to anonymous towns, and bought goods by weight. The population now earned money in exchange for labor, and bought goods from people they did not know. This gradual shift required more scales, and hence prosperous scale-makers.

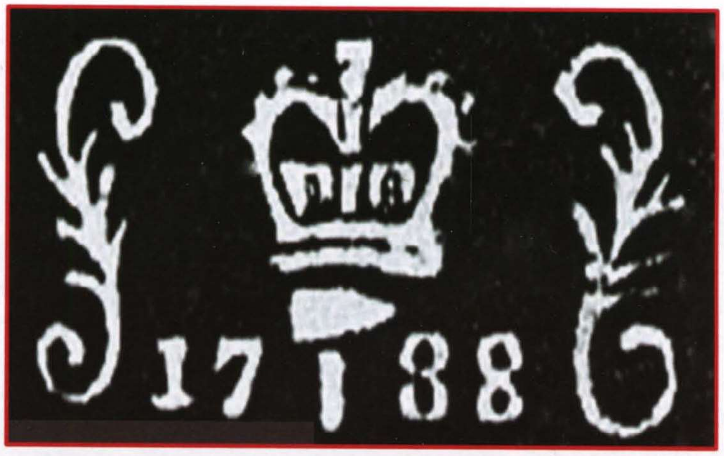
The year 1788 was a momentous year for Thomas Bourne, aged 25, as he established his workshop on Digbeth in south-east Birmingham. See Figure 5 for a copy of Bourne's 1838 advert stating he established his business in 1788. And the puffery is exposed...Bourne was the predecessor of Day & Millward who claim an establishment date of 1700! See Figure 6 for a drawing of his trade sign.



THOMAS BOURNE,
BROAD STREET, BIRMINGHAM.
Established 1788,
MANUFACTURER OF EVERY DESCRIPTION OF IMPROVED
Patent Weighing Machines,
SCALES, SCALE-BEAMS,
STEELYARDS, SCREW-PLATES, DIE STOCKS, PATENT SUGAR MILLS,
ENGLISH AND FOREIGN WEIGHTS, &c. &c.

Figure 5. ≺≺ Thomas Bourne's 1838 Advert illustrating the establishment of his business in 1788.

Figure 6. ➢➢ Thomas Bourne's trade sign, 'Crown & Hammer' hung over the door to his shop and appeared on many of his beams. The crown has no implications of royal appointment, and many iron workers used a hammer in their trade signs.



He married Hannah Smith on May 12, 1788. His marriage was witnessed by his older brother George Bourne who married Hannah Smith's sister. How the Bourne men met the Smith sisters is unknown.

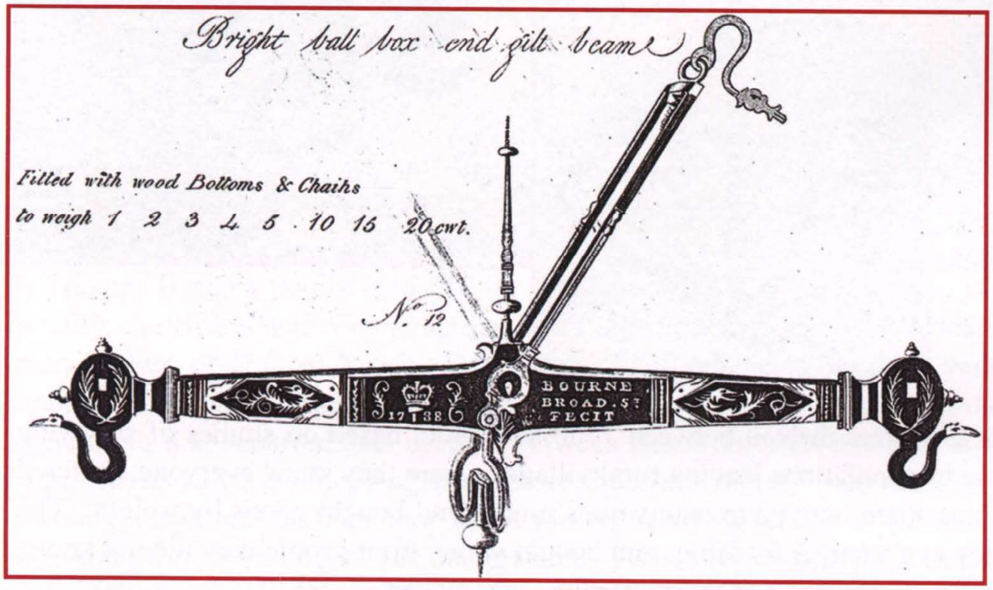

Bright ball box end gilt beam
Filled with wood Bottoms & Chains
to weigh 1 2 3 4 5 10 15 20 cwt.
No 12
17 88
BOURNE
BROAD. St
FECIT

Figure 7. ≺≺ Original equal-arm beam design from Bourne's c1836 catalog. His shop sign is to the left, and his location to the right, of the fulcrum. Note: fecit is Latin for 'he made' or 'made by'. It is not known if Bourne employed someone in-house full time to paint the intricate designs onto his beams and scales, or if he sent his work out to be decorated.

We have a good idea of his equal-arm beam design based on his c1836 catalog. Figure 7 contains a page showing an equal-arm beam dated 1788 with the crown and hammer design and his Broad Street location. Comparing Figure 7 with Figure 1, we observe Bourne produced the traditional British beam design he learned in his apprenticeship to T. Beach. British scale-makers prided themselves on maintaining traditions. The 'sea horse' design in Figure 6 is very similar to the 'sea horse' design utilized by Duke Oliver on his equal-arm beams in Bristol, 88 miles south of Birmingham. For sure not the same artist. See Figure 8.

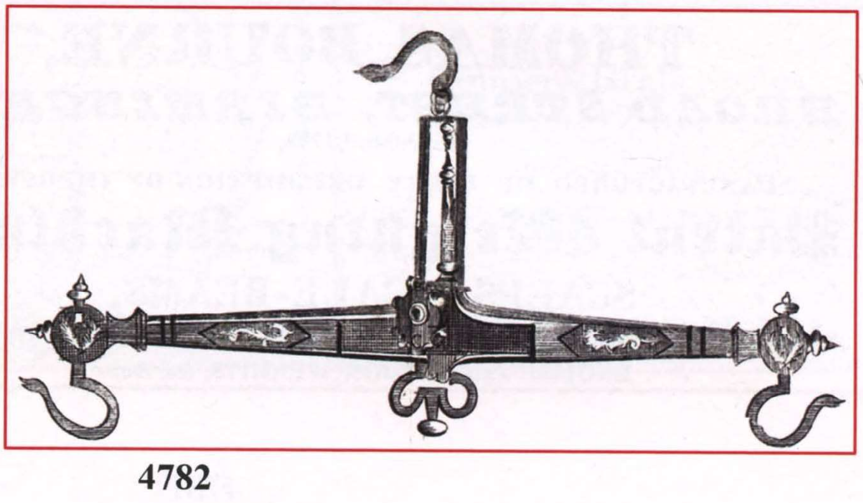


Figure 8. ➢➢ Beam decorated with "sea-horses" by Duke Oliver in Bristol in 1850.

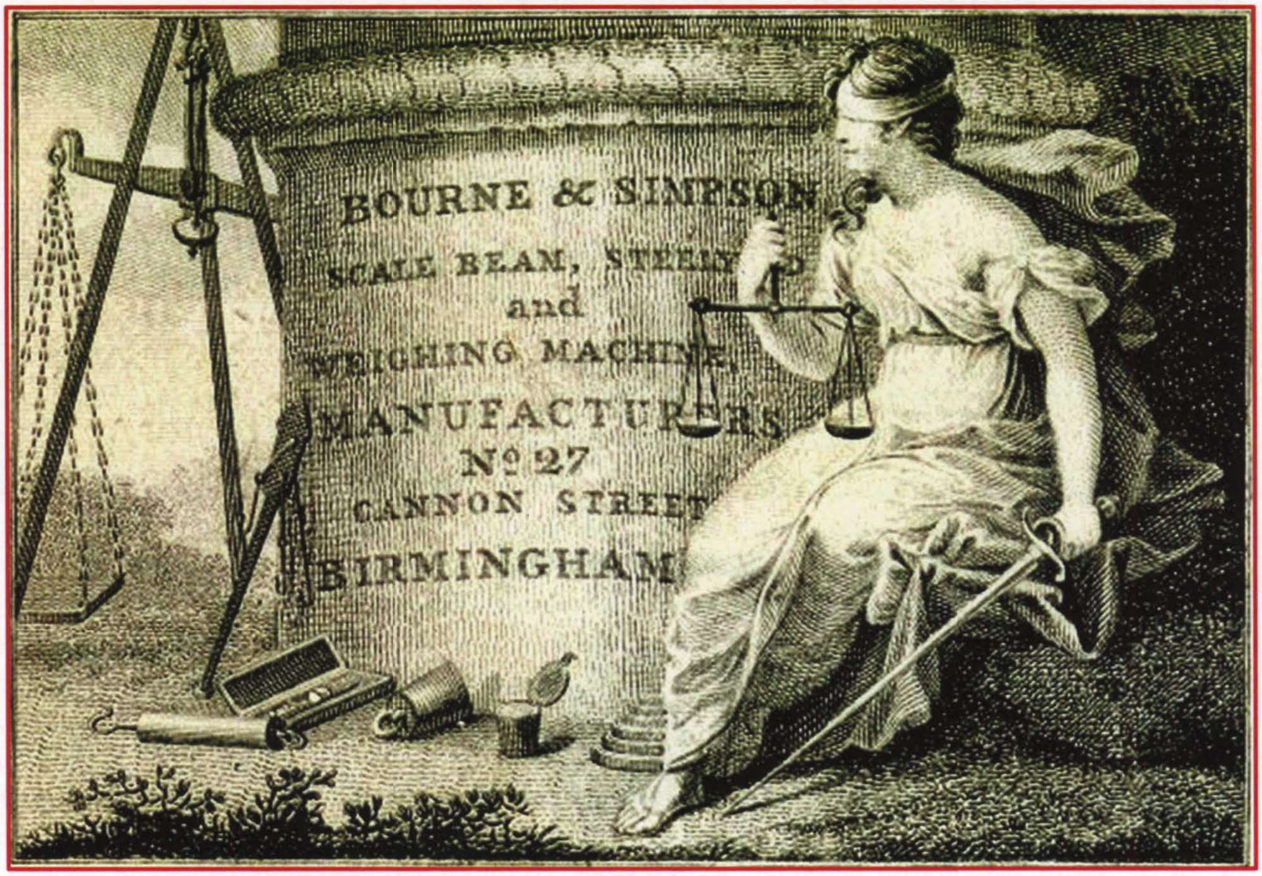


Figure 9. ▲▲ Bourne & Simpson trade card. Bourne stands out from most other Birmingham scale-makers by having a stylish trade card and shop sign.

Thomas Bourne & Four Partners - 1800 to 1832

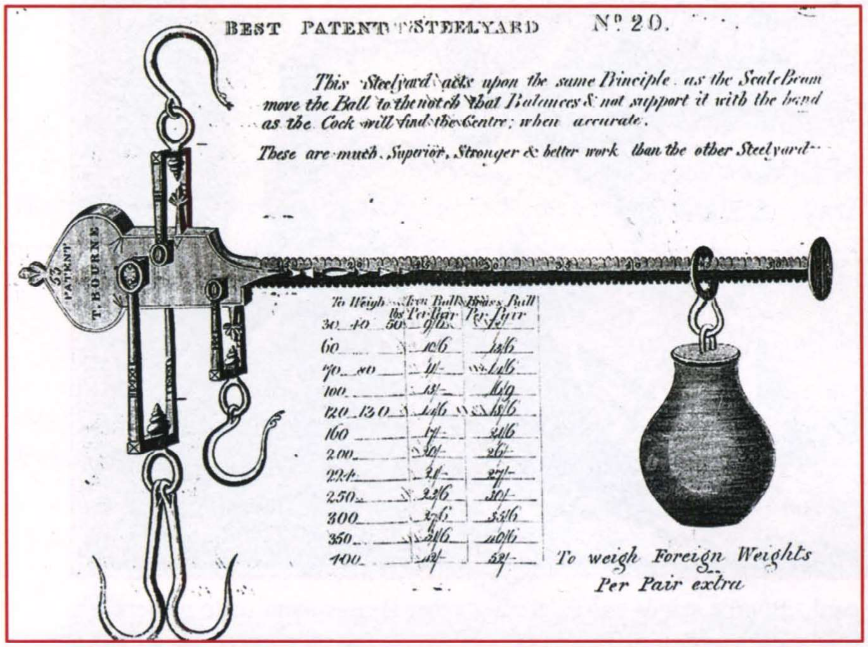
From 1800 to 1802, Bourne partnered with Edward Simpson, and located their workshop at 27 Cannon Street. See Figure 9 for a copy of their trade card. This collaboration produced turn-over steelyards, beams, weighing machines, tubular spring balances, nesting & stacking weights, ring weights, and boxed money scales. Loose weights were an important part of a scale-maker's business since most goods in the 19th century were weighed individually in front of the customer using an equal-arm beam.

The Blindfold Justice on their trade card illustrated that justice was dispensed as fairly as scales dispensed goods. Scale-makers were proud of their product being used to symbolize justice. The *London Gazette* reported the partnership was dissolved in November 1801, and *all debts to be paid by Bourne.* This legal wording covered all money owed to the partnership, and money due to be paid by the partnership, since he was the one carrying on the business.

In 1803, Bourne established a partnership with William Chambers that lasted for 18 years; located at 21 Broad Street. William Chambers was a button-maker on Vale Street before joining Bourne. It is interesting to speculate why Bourne would partner with a button-maker. Whatever the reason, it appeared to be successful, and was Bourne's longest running partnership which produced two innovations:

1) In 1806, they advertised their *Best Patented Steelyards that are much superior, stronger, and work better than other steelyards*. See Figure 10 A, B & C. These steelyards had the tips of the pippin steel bearings in line which-ever way up the steelyard was oriented.[5]

2) Additionally, in 1806, they took out a patent for a steam roasting jack with Chester Gould, a mechanic. Were they considering branching out into steam-powered engines?[6]



BEST PATENT STEELYARD Nº 20.

This Steelyard acts upon the same Principle as the Scale Beam move the Ball to the notch that Balances & not support it with the hand as the Cock will find the Centre; when accurate.

These are much Superior, Stronger & better work than the other Steelyard

To Weigh lbs	Iron Ball Per Pair	Brass Ball Per Pair
30 40 50	9/6	13/-
60	10/6	14/6
70 80	11/-	14/6
100	13/-	16/9
120 130	14/6	18/6
160	17/-	21/6
200	20/-	26/-
224	21/-	27/-
250	22/6	30/-
300	27/6	35/6
350	31/6	40/6
400	41/-	52/-

To weigh Foreign Weights Per Pair extra

Figure 10A. ◀◀ Bourne #20 steelyard catalog page, c1830

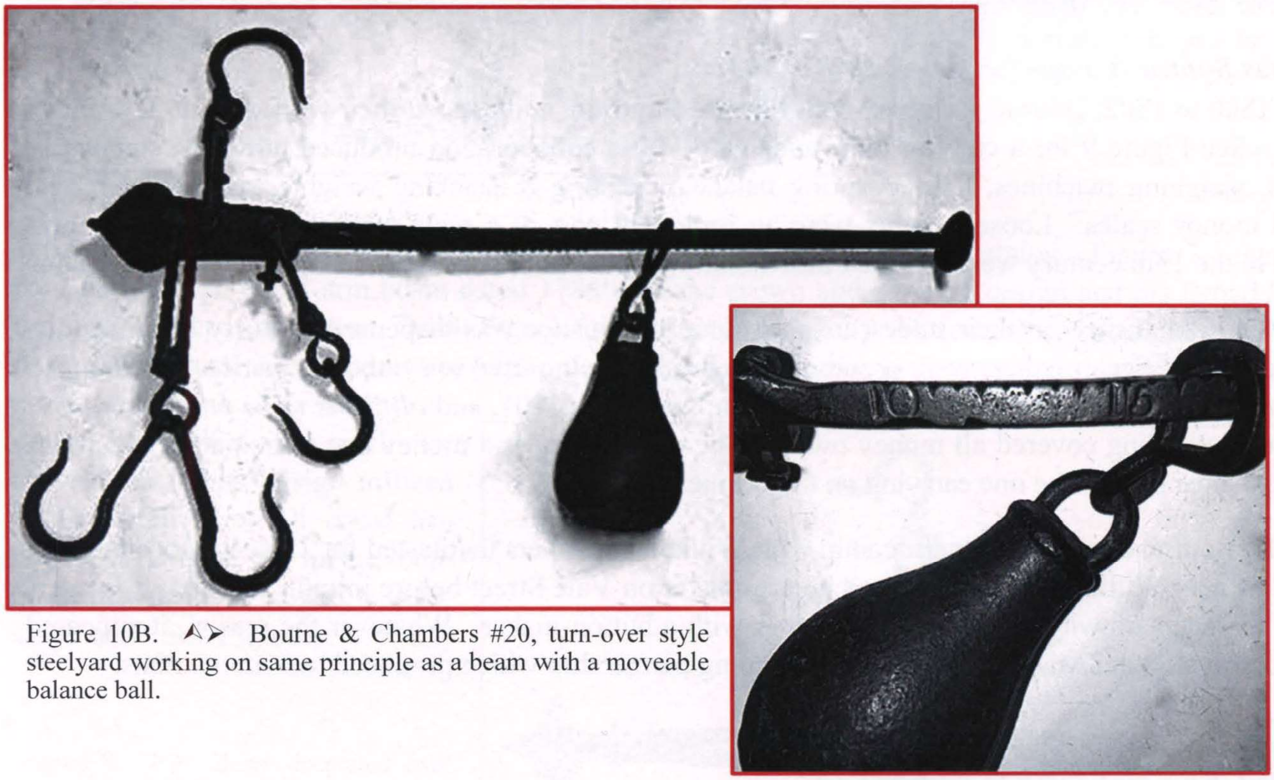


Figure 10B. ▲➤ Bourne & Chambers #20, turn-over style steelyard working on same principle as a beam with a moveable balance ball.

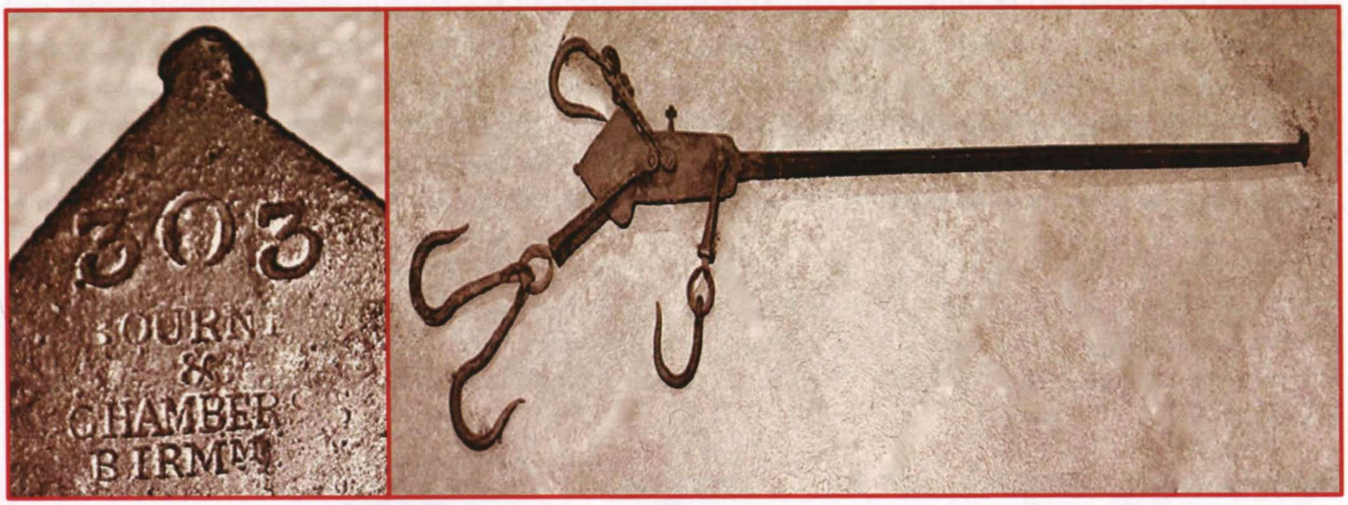


Figure 10C. ▲▲ Bourne & Chambers #303 Turn-Over Steelyard; 300 Lb. Capacity; Beam 30-Inches long; weight is 5 lbs.

Birmingham industries, including scale-making, employed men, women, and children who worked long hours 6 and 7 days a week, for low wages in un-healthy and poorly illuminated environments. Some areas of the buildings vibrated so badly lamp mantels broke forcing workers to work in semi-darkness. Outsiders commented the locals stank of oil and emery, had complexions composed of oil and dust, smoke dried, with red eyes and green hair (from working around hot brass furnaces). The town was an inferno of smells, heat and noise coming from the drop-hammers. The air was constantly smoke filled from burning coal to heat the forges. There were more jobs available than skilled men to fill them, and most were competent in at least two trades so they could switch trades during lean times.

The following data provides some insight into the low wages paid to brass-workers c1810-1840 in shillings per week for 90-hours of work: cock-founder 42-45, stamper 20-25, laborer 15-18, lad (boys) 7/6-10/6, dipper 20-30, lacquerers 8-10 (women) and 3/5 (girls), metal roller 40-50, finisher 24-26 (brass dust being hazardous to their health), tube-maker 30, and soldering 10-12 (women). Remember, there were 20 shillings per £1. So, the stamper paid 20 shillings per week was earning the equivalent of £111 ($153) per week today! It is no wonder there are reports of families living on bread, gruel made from oats or barley cooked in water, and weak tea!

On May 7, 1810, T. Bourne's journeymen (John Heard, and eight others) filed an advertisement in the *Aris Gazette* petitioning for a raise in working pay. The number of senior men petitioning is a good indication Bourne had a large scale-making enterprise. By all indications, they received the raise since they continued to work for Bourne for the next 40 years!

Thomas Bourne and William Chambers were also Factors in Birmingham. Factors were middlemen, buying the work of other makers (usually in his own type of product) and selling it to others. Often the words 'Merchant and Factor' were mentioned together. There were many Factors in Birmingham, and they provided a service for small producers who were earning just enough money to keep the creditors away, but required a regular stream of cash. Factors sometimes provided warehousing services, guaranteed buyer's credit, and made cash advances.

The *London Gazette* reported this partnership dissolved, by mutual consent, in December 1821, and again, *all debts to be paid by Bourne* since he was carrying on the business.

After Bourne and William Chambers amicably ended their 18-year partnership, Chambers set up his home and workshop at 118 Suffolk Street. This is very close to Bourne's location on Broad Street, and likely led to a continued collaboration between the two men. William Chambers trained his nephew William Chambers Day as a scale-maker, and this is Day in the Day & Millward scale company at 118 Suffolk Street who will be the focus of a future article. William Chambers disappeared from directories in 1821, and I found nothing dated until his Will of 1827. At the end of his life, he referred to himself as a Gentleman, so it appears he had a period of retirement before he died.[7]

In 1821, Thomas Bourne formed a 7-year partnership with William Painter at 29 Broad Street. This collaboration produced a wide assortment of steelyards, scale beams, and weighing machines as illustrated in their advertising. They were also Merchants and Factors. Their adverts in *Wrightson's Directory* were identical to the earlier adverts by Bourne & Chambers, and identical to the later Bourne sen. advert in Figure 11.

Bourne's advert appearing in the *Wrightson's 1828 Directory of Birmingham* is interesting from many perspectives:

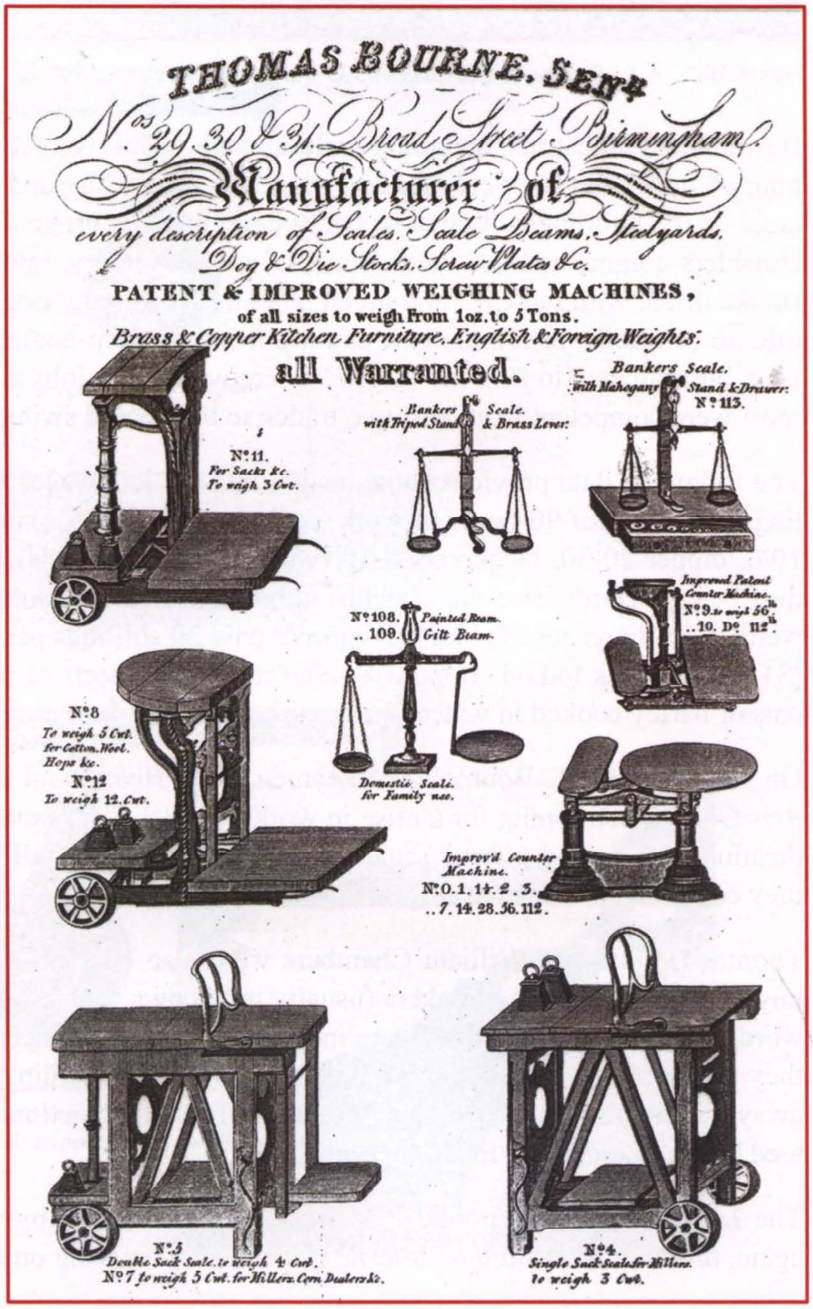
1) Thomas Bourne added the sen. notation behind his name to differentiate himself from his nephew, Thomas Bourne jun, who was also in the scale-making business, at 1 Mount Street.

2) This is among the first illustrated adverts for a platform scale in a Birmingham directory. Other scale-makers soon followed in advertising their platform scales.

3) In this advert, he stated *patented and improved weighing machines from all sizes to weigh from 1 oz. to 5 tons,* which sounds strange. Conventionally, the term weighing machines denoted weighing heavy goods. This was quite the capability statement especially since there was no British patent for a roberval scale! It was not unusual in the 19th century to claim patents in advertising when none existed, or the patent was for a minor aspect of the design. This is another example of puffery that carried forward to Day & Millward advertising to be illustrated in a future article.

4) *Brass and Copper Kitchen Furniture* does not mean furniture to sit upon. In this context, furniture means ladles, sieves, mills, spittoons, and similar kitchen furnishings not including hollow ware (pots and pans).

5) *Supplying English and Foreign* Weights was a good indication Bourne had an export business to British colonies, and possibly world-wide.



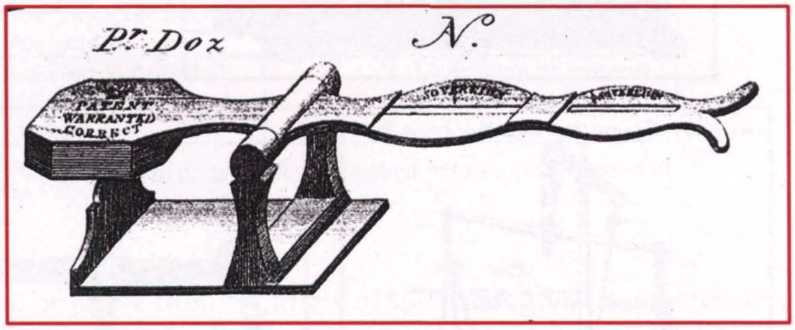
THOMAS BOURNE, SENR
Nos 29 30 & 31. Broad Street Birmingham
Manufacturer of
every description of Scales, Scale Beams, Steelyards,
Dog & Die Stocks, Screw Plates &c.
PATENT & IMPROVED WEIGHING MACHINES,
of all sizes to weigh from 1oz. to 5 Tons.
Brass & Copper Kitchen Furniture, English & Foreign Weights:
all Warranted.

Bankers Scale.
with Mahogany Stand & Drawer:
No 113.
Bankers Scale.
with Triped Stand & Brass Lever:
No 11.
For Sacks &c.
To weigh 3 Cwt.
Improved Patent Counter Machine.
No 9. to weigh 56lb
..10. Do 112lb
No 108. Painted Beam.
.. 109. Gilt Beam.
No 8
To weigh 5 Cwt.
for Cotton, Wool.
Hops &c.
No 12
To weigh 12. Cwt.
Domestic Scale.
for Family use.
Improv'd Counter Machine.
No 0. 1. 1½. 2. 3.
.. 7. 14. 28. 56. 112.
No 5
Double Sack Scale. to weigh 4 Cwt.
No 7 to weigh 5 Cwt. for Millers. Corn Dealers &c.
No 4.
Single Sack Scale for Millers.
to weigh 3 Cwt.

Figure 11. ⮝⮝ Bourne sen.'s 1828 Wrightson's Directory advert.

Bourne sen and Smith were also Merchants and Factors. Thanks to research by Michael Foster, frequent EQM author, we now know Bourne was operating as a Factor reselling a 'Patent Warranted Correct' sovereign rocker made by John Crane. The rocker in Figure 12 has been identified by Michael Foster as being made by Crane & Spooner of 26 Cannon Street, Birmingham. Its distinctive shape with the high-rise base and large fish-tail end, the hexagonal poise, and the words PATENT WARRANTED CORRECT, with CORRECT curved up at the ends, are all identified as Crane & Spooner rockers, made between 1823 and 1829. William Spooner died in 1829. This presumably means that the drawing for Figure 12 was made between 1823 and 1829. Most scale-makers of the time worked on a combination of in-house production combined with being a Factor to provide a broad offering to their customers, save the cost of duplicate foundry casting patterns, and enable larger foundry production of a given model.

Figure 12. ➤➤ 'Patent Warranted Correct' sovereign rocker made by John Crane, brass founder, with the Crane 'crown mark', and re-sold by Thomas Bourne sen. Drawing from Bourne's c1836 catalog. Note, these rockers were being sold by the dozen!



The *London Gazette* reported that Bourne & Smith's partnership was dissolved in 1829, but the business was continued by both partners. On March 31, 1832, this partnership was dissolved permanently.

Thomas Bourne sen Working Alone - 1832 to 1847

From 1832 to the end of his working days, Thomas Bourne sen worked alone in his weighing machine manufactory located at 29 to 31 Broad Street. At this time his catalog featured over 30 types of steelyards, beams, weighing machines, rockers, scales and brass and iron weights. See Figure 13A & B. As illustrated, Bourne's scale, beam and weighing machine offerings had tremendously expanded in both quantity and complexity since his beginnings in 1788 on Digbeth with Mr. Court.

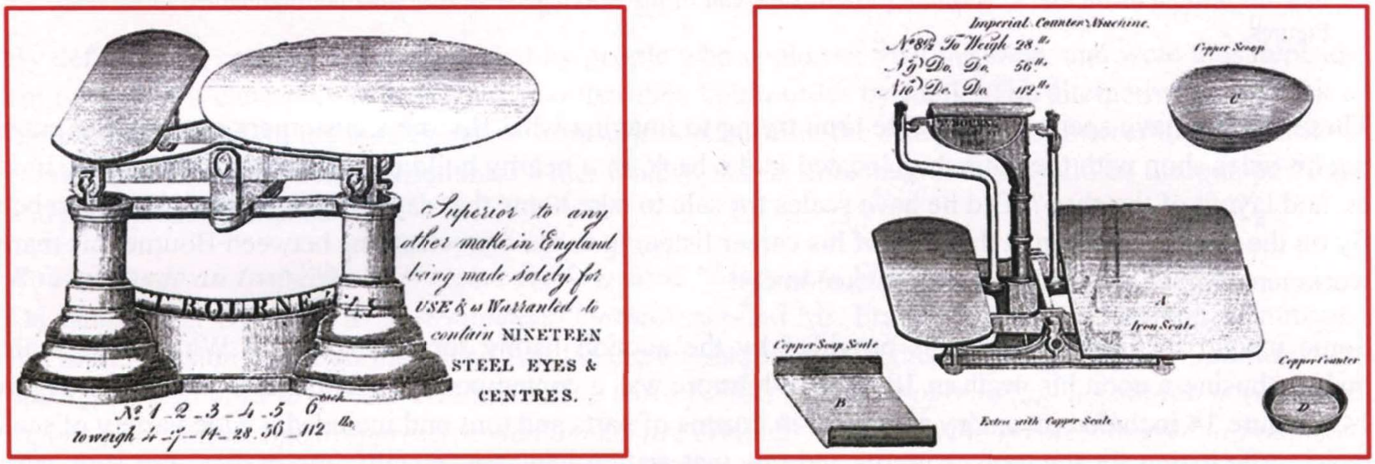

T. BOURNE
Superior to any other make in England being made solely for USE & is Warranted to contain NINETEEN STEEL EYES & CENTRES.
No. 1 _2 _3 _4 _5 6 each
to weigh 4 _7 _14 _28 _56 _112 lbs
Imperial Counter Machine.
No. 8 To Weigh 28 lbs
No. 9 Do. Do. 56 lbs
No. 10 Do. Do. 112 lbs
Copper Scoop
C
A
Iron Scale
Copper Soap Scale
B
Extra with Copper Scale
Copper Counter
D

Figure 13A. ⮝⮝ Brief overview of Bourne sen.'s c1836 catalog. Selected scales illustrated here are meant to illustrate the breadth of Bourne's capabilities towards the end of his working career that were not highlighted in previous Figures.

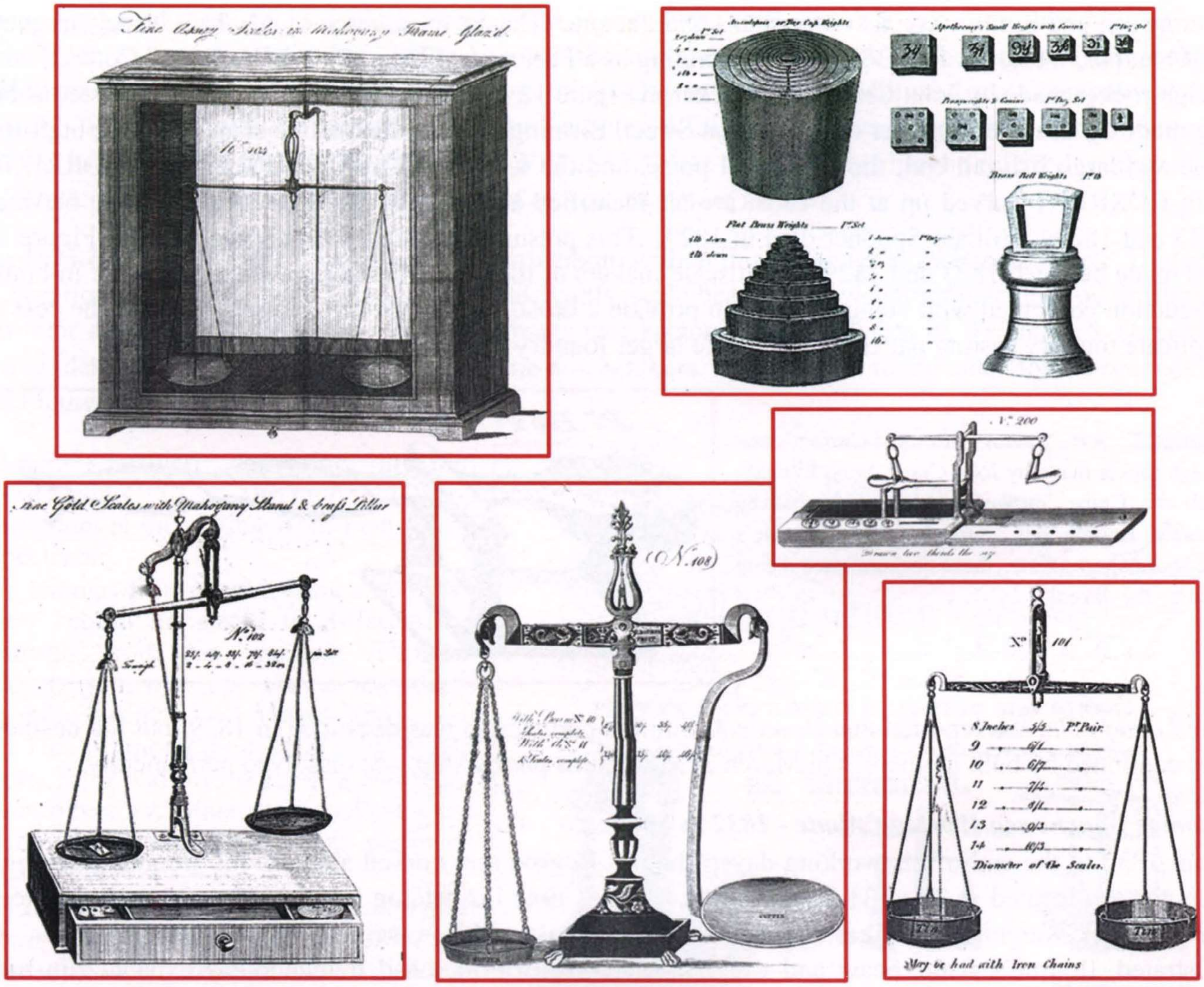

Fine Assay Scales in Mahogany Frame Glaz'd.
No 104
Apothecary's Small Weights with Covers
Brass Bell Weights
Flat Brass Weights
No 200
Fine Gold Scales with Mahogany Stand & brass Pillar
No 102
(No 108)
No 101
8 Inches 5/3 Pr Pair
9 6/1
10 6/7
11 7/4
12 8/1
13 9/3
14 10/3
Diameter of the Scales.
Tin
Tin
May be had with Iron Chains

Figure 13B. ⩓⩓ Further overview of Bourne sen's c1836 catalog. Selected scales illustrated here are meant to illustrate the breadth of Bourne's capabilities towards the end of his working career that were not highlighted in previous Figures.

These authors have spent considerable time trying to imagine what Bourne's customers experienced entering his sales shop with the workshop located in the back, or a nearby building. What were the smells, noises, and layout of the shop? Did he have scales for sale to take home that day, or take orders? If only to be a fly on the wall in his shop at the peak of his career listening to the conversations between Bourne, his many workmen, women and children and his customers!

Some insight to these questions is provided by the auction listing for Richard Ford Whitmore's scale-making business upon his death in 1834, as Whitmore was a contemporary of Thomas Bourne. See Figure 14. Figure 14 included inventory measured in dozens of parts and tons and included a wide variety of scale types. The listing for the tools, patterns and raw material on-hand was equally impressive. For sure, early 19th century scale-makers owned and operated complex operations with a lot of money tied up in raw material and finished goods.

Qty.	Description	Qty.	Description	Qty.	Description
327 dz.	Black Beams	30 dz.	Counter Beams	16 dz.	Round-end Beams
15 dz.	Ring Steel Beams	104 dz.	Bright Flat Beams	93 dz.	Bright Round Beams
26 dz.	Bright Box-end Beams	13 dz.	Bright Round-end Beams	13 dz.	Assorted Box-end Money Beams
	Assay Scales w/ Weights		Gold & Silver Scales w/ Weights		Apothecary Scales in Tin Boxes
8 dz.	Large Painted Round & Square Weigh Beams 68-235lb		Large Dutch-end Beams from 68-235lb	787 pr.	Iron-ball Steelyards from 30-585lb
107 pr.	Steelyards in Ounces from 30-100lb	31 pr.	Hay Steelyards from 80-160lb	21 pr.	Patent Steelyards from 100-400lb
4 pr.	Large Steelyards from 1-13 tons		Heavy-head & Pocket Steelyards		Sets of Dutch, Neapolitan & Troy Weights
2	Whitmore Complete Dial Weighing Machines 105 & 150lb	4 ½ Tons	Assorted & Adjusted Weights		Assortment of Patterns

Figure 14. ▲▲ Auction listing for Richard F. Whitmore's scale-making stock of finished goods as it appeared in the *Aris Birmingham Gazette* on May 9, 1834.

Figures 7, 10A, 12, and 13A & B are copies of pages from Bourne's c1836 catalog that can be closely dated since it contains china plates that were invented by William Juggins (a London butter & cheese monger) in 1836, and not much latter, as Juggins' china weights invented in 1839 were not included.

Eighteenth Century catalogs are exceedingly rare, and historians have avoided answering the question why. There are two possible explanations: 1) Very few were printed in the first place due to cost, as much as £1 each in 1836![10] 2) Books and catalogs with pictures and line drawings of products made wonderful playthings for children, and young ladies, making scrapbooks.

Notably, W & T Avery did not print their first scale catalog until c1830, and used some of the old print blocks from Thomas Beach's earlier catalog where Beach's name is clearly visible in many of the old cuts and [printer's blocks] in the drawings.

By definition, a catalog was only needed by people who could not visit the shop, and were thus dependent on seeing a clear picture with prices so that they could order by mail. The alternative was to ask a representative visiting the area to obtain what was needed from the scale-maker. Interestingly, Bourne's catalog makes no mention of discounts. Traditionally, at this time bulk orders would be discounted 10%, and sometimes as high as 25%.

Bourne made an Inspector of Weights & Measures; "License to Steal"

On January 12, 1835, the *Aris Birmingham Gazette* reported Mr. Francis Lloyd [a tradesman] commenting in the Session Court on the recent Act for the regulation of Weights and Measures as: *...perhaps the most absurd Act of Parliament ever passed...a more perfect specimen of bungling legislation never came before your notice...most oppressive monopolies are created, ruinous in the greatest degree to the interest of tradesmen who are sacrificed for no earthly good...a monopoly like the one granted in this Act could be so barefacedly given to any body of men in this age...*

Birmingham, and neighboring Coseley, manufactured vast quantities of brass and iron weights for British consumption and export. Fifteen-tons of brass weights were produced annually. Stamping the six weights of a pound down[11] was levied at 10½d and estimated to earn £1700 per year[12] to the Inspectors! It was estimated this area produced 200 tons of iron weights per year, verified at ½d per pound down so the fees would be £1500 to £1600 per year to the Inspectors! This author suspects that at some point these fees were reduced or the newspapers of the day would be full of complaints.

Parliament had now passed several acts legislating for W & M Inspectors. The questions facing the authorities were: Who had the skill and equipment to check weights accurately? Who had the skill and tools to remove, or add lead to a weight precisely? Who could apply verification marks in such a way that a tradesman could not fiddle with the adjustments? Answer: A scale-maker.

On February 2, 1835, the Court appointed the following scale-makers as Inspectors of W & M for Birmingham: William Henry Avery, William Blews, Thomas Bourne sen, Thomas Bourne jun, William D Brownell, William Chambers Day, Lawrence Garland, and Edward Whitfield in addition to the previously appointed George Payne. This job required someone of probity, known honesty, and held the respect of his community. At this time, the salary for an Inspector was £59/1 per year[13] in addition to the above fees for the verification of weights at a foundry. Not a bad salary for maybe a day a week of work.

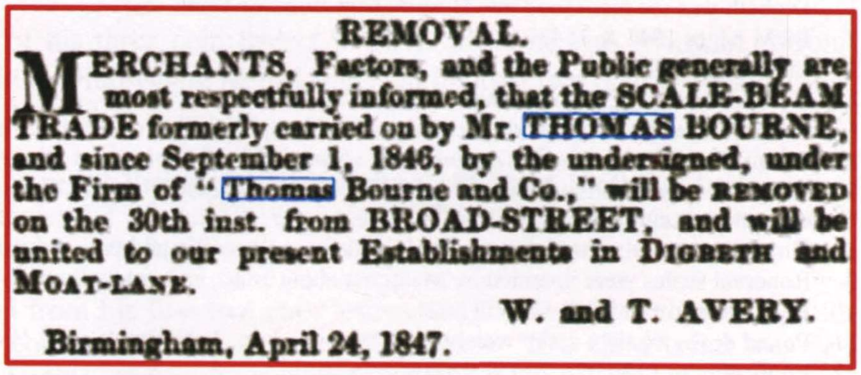
By early 1835, Edward Whitfield & Son, Thomas Bourne sen, Boulton & Watt, William C. Day, and W & T Avery were the only scale-makers in Birmingham who owned a set of the 1835 Exchequer Standards by which all commercial weights in England were regulated. The Standards from the Exchequer are distinctive because they bear the verification mark of the Exchequer, a chequer board pattern, not those of Founder's Company, or the Guildhall. These were very expensive, and only used occasionally in the office so they retained their full precise weight. Inspectors kept them in locked cupboards, and only used them to check their Working Standards which were exact copies of the Exchequer Standards. The Working Standards were subject to the bruising life of the foundry and travels of the Inspector and therefore received much more wear since they were taken to various locations within the jurisdiction for verification purposes. Working Standards were not included in scale-maker catalogues. They probably charged a premium for them and possibly even refused to sell them to casters who did not have a good reputation. After all, they wanted themselves to be the firms that had the best and most reliable weights.

Each Inspector executed the verification process in whatever fashion they desired, so few generalizations can be made. Normally, the penalty of grossly inaccurate weights, scales, or measures was destruction of the offending article, and a hefty fine for the offender unless he groveled and apologized to the satisfaction of the Inspector. Therefore, Bourne was working among the best scale-makers in Birmingham at the time using the best, most accurate equipment, in competition with Boulton & Watt who had the highest possible reputation and had a contract to mint money for England.

On March 16, 1835, Thomas Bourne sen and 8 others, wrote a letter to the High Bailiff, concerning a W & M Act of Parliament. The *London Gazette* reported: *Sir, Lord Ebrington having given notice of his intention to bring in a bill to amend the late Act of Parliament relating to* [Trade] *Weights and Measures, we, the undersigned inhabitants of Birmingham, request you, at your earliest convenience, to call a MEETING of those persons who are interested in the Measure, in order that a Committee may be formed to watch the proceeding, or take such steps as occasion may require. We are, Sir, your very obedient servants, Martineau and Smith, Thomas Bourne sen, Francis, Smith and Hawkes, Edward Whitfield & Sons, Thomas Bourne jun, William & Thomas Avery, William Chambers, James Barlow, Yates, Birch & Spooner.*[14] So Thomas Bourne sen was respected by his peers, and a leader in his trade. It appears Lord Ebrington was working to amend his previous W & M Act as a result of the comments made in Courts around the country as illustrated above from the Birmingham session, and T. Bourne and company were seeking the High Bailiff's support to protect their trade and position of inspector.

Being a scale-maker and inspector was a lucrative combination. These individuals were paid to verify new weights at the foundry (exported weights were shipped un-verified), inspect weights and scales in use to verify they were accurate, most likely received the job of repairing or replacing scales and weights found in use that were not accurate, and had the opportunity to sell new scales to the merchant during an inspection visit to his shop. Based on public records and Wills of these individuals, who retired from scale-making during this time, they lived as Gentlemen and died quite wealthy.[15]

I have found no useful documentation to indicate when Thomas Bourne jun took over the scale-making business of his uncle Thomas Bourne sen on Broad Street. Since he was a nephew, he was born in the early 1780s, and would have been about 60-years of age when he sold the business to W & T Avery on April 24, 1847. See Figure 15 for a copy of Avery's advert in the *London Gazette* announcing this purchase. This would have been a good age for Bourne jun to have retired and lived on his savings as a Gentleman.



REMOVAL.

MERCHANTS, Factors, and the Public generally are most respectfully informed, that the SCALE-BEAM TRADE formerly carried on by Mr. THOMAS BOURNE, and since September 1, 1846, by the undersigned, under the Firm of "Thomas Bourne and Co.," will be REMOVED on the 30th inst. from BROAD-STREET, and will be united to our present Establishments in DIGBETH and MOAT-LANE.

W. and T. AVERY.

Birmingham, April 24, 1847.

Figure 15. ▲▲ *London Gazette* advert announcing the purchase of Thomas Bourne's scale-making business by W & T Avery.

Thomas Bourne sen, Will

Thomas Bourne's Will, written in April 1841, left everything to his widow Hannah, except £500 to his son-in-law, Dr. R T Dickens (who had married Bourne's daughter, Amelia.)[16] Hannah got the house and contents, carriage, horse and harness and £1,000[17], and the rents and profits from their houses and estates for the rest of her life. When she died, everything went to Bourne's grandson, Thomas Bourne Dickens.

Thomas Bourne sen died October 1842.

It is interesting his daughter, Amelia, married a doctor, one of his friends was a doctor, and another was a surgeon. This suggests Bourne sen was a well-educated man as well as a successful businessman.

Conclusion

Thomas Bourne sen witnessed and actively participated in many changes to the scale-making trade. He learned new skills and increased his variety of scales and weights during five partnerships over 44 years. He appeared to be a leader, influencer in his trade, respected by his peers, and trusted by the community. At the end of his life, he was quite wealthy, having enough saved to retire and live comfortably. He and his wife had two female servants as well as a man servant living in their home.

This is only the foundation of the Day & Millward story. In this introductory portion, we have followed Thomas Bourne's journey from a lad of 13 years of age beginning his apprenticeship with Thomas Beach, the antecedent of the famed W & T Avery company. We have traced his progress from making relatively simple steelyards and beams to an extensive catalog of 30-plus scales and weighing machines with stated capabilities of 1 oz. to 5 tons. His nephew sold the enterprise to W & T Avery at the end of his working career to also retire as a Gentleman.

A much larger and interesting, story of scales, weighing machines, weighing innovations – Design Registrations and Patents, and interactions with other Birmingham scale makers during the Day & Millward years, will appear in the next issue. Their story will appear on William Chambers Day and John Millward leading to the formation of Day & Company, Day & Millward, and finally Day & Millward Ltd., ending with their contribution to WWII efforts.

Endnotes:

1. Digbeth was the main road into Birmingham from the south-east.
2. EQM pages 1541 & 1543.
3. EQM page 1507.
4. Equivalent to £31,398 or $43,065 in 2021.
5. See EQM page 1543 for further explanation about positioning of bearings on steelyards.
6. Patent "*for roasting meat by the power of steam & for other purposes where small powers are necessary.*" 24 June, 1806.
7. The term 'gentleman', when used in a Will, implied a man prosperous enough to live on his savings. It did not imply high education or culture.
8. Directories merely listed them as Scale-makers at a specific address. Adverts gave details of their products.
9. Roberval scales were invented by Medhurst about 1810, and gradually people accepted them as reliable.
10. Equivalent to £115, US $156 in 2021.
11. Pound down meant a set of weights of 1 lb, 8 oz, 4 oz, 2 oz, 1oz, ½ oz & ¼ oz.
12. Equivalent to £189,026, or US $260,855 in 2021.
13. Equivalent to £6,560, or US $9,053 in 2021.
14. Signatories to letter, and business partners of T. Bourne sen: Martineau & Smith [Brass Founders], Francis, Smith & Hawkes [Iron Founders, located next to Bourne and provided iron castings for weights and beams], Edward Whitfield & Sons, Thomas Bourne jun, William & Thomas Avery, William Chambers Day [the Day in Day & Millward], James Barlow [Brass Founder], Yates, Birch & Spooner [Merchants & Factors & Mould-makers].
15. Around 1850 the job of W & M Inspector was turned over to Policemen, or other trusted tradesmen, who did not have a financial incentive to find weights or scales in use inaccurate.
16. Bourne's daughter Amelia married Richard Tandy Dickens, but died in 1839.
17. £1,000 for her own use, equal to £113,930 in 2021, US $137,540 in 2021.
18. Location of scale-makers mentioned: William Henry Avery (12 Digbeth), William Blews (3 Bartholomew St.), Thomas Bourne sen, (Broad St.), Thomas Bourne jun (1 Mount St.), William D Brownell (Bordesley), William Chambers Day (118 Suffolk St.), Lawrence Garland (47 Bull St.), and Edward Whitfield (16 Church St.), George Payne (50 Rea St.).

People End Notes:

Thomas Bourne sen: Born 1763; married Hannah (Ann or Anna) Smith in Birmingham St. Martin, Warwickshire on May 12, 1788; died August 12, 1842; burial at St. Philip, Birmingham, Warwick, England. Lived in Highgate.

Thomas Bourne jun: Baptized September 30, 1789 at St. Martin's in Birmingham; 1841 Census listed as a 'Machine Maker'; his wife was Ann; with 7 children and 2 female servants.

Dedication: This article is dedicated to the memory of **Andrew Crawforth**, son of Diana and Michael Crawforth – two of our ISASC Founders. This is one of the last EQM articles Andrew provided insights, steady guidance, and friendship to these authors. His contributions will be sorely missed.

References:

The Crawforth Index cards for T. Bourne, and his partners, 24 cards used for this article

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1878 Maranville Dial Coin Tester

BY MALCOLM MATHIAS

1878 Harvey Maranville Dial Coin Tester – Background
This type of scale is also known as a Counterfeit Coin Detector (or CCD)

Harvey Maranville invented the third of his three coin testers in 1878 while he was living in Akron, Ohio, after he moved (1861) from Clinton, Ohio where he had invented his first two coin testers in 1857 and 1860.

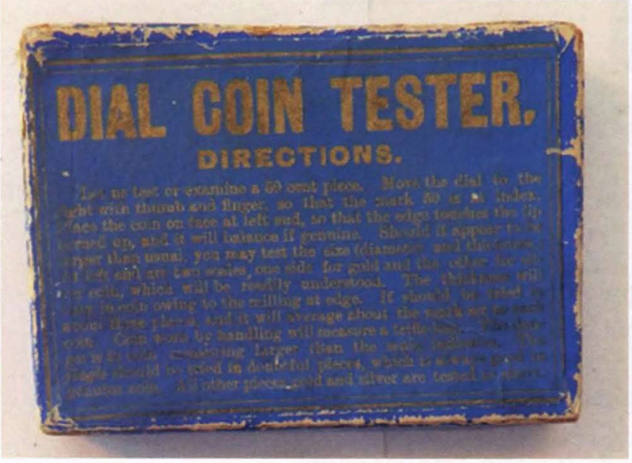
This third coin tester in 1878 differed from his first two coin testers in 1857 and 1860 that both used a sliding beam to provide the counter-balance for the coin being tested. This third tester used a weighted disc to provide the counter-balance for the coin being tested.

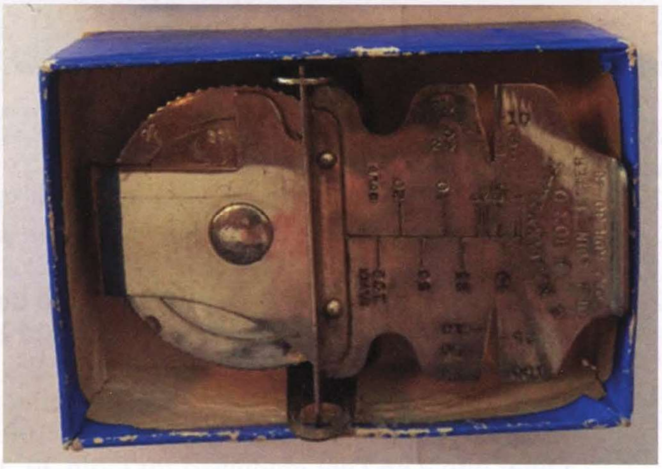
This third balance in 1878 also differed from his first two coin testers in 1857 and 1860 that were both designed to test both US and Foreign coins, for both silver and gold coins. This third tester was designed to weigh only US silver and gold coins, no Foreign coins at all.

Newman and Mallis described the 1878 coin tester as:
Flat nickel plated brass plate with integral knife edges that rotate about a metal post set on a metal base. Raised edge on one side has markings to indicate the diameter of all United States silver and gold coins then current. The same side has notches in varying depths to gauge the thickness of the coin. The counterweight end has a revolving disk with the counterweight attached. This weight is moved to a predetermined position to weigh specific coins. Overall length of the device is three and one half (3 ½) inches (8.90 cm) long and two and three eighths (2 3/8) inches (6.03 cm) wide. Source: Newman, Eric P. and Mallis, A. George, 1999, ***U.S. Coin Scales and Mechanical Counterfeit Coin Detectors***, CHP. IV: SEC. 4: P 1 [IV-4-3]

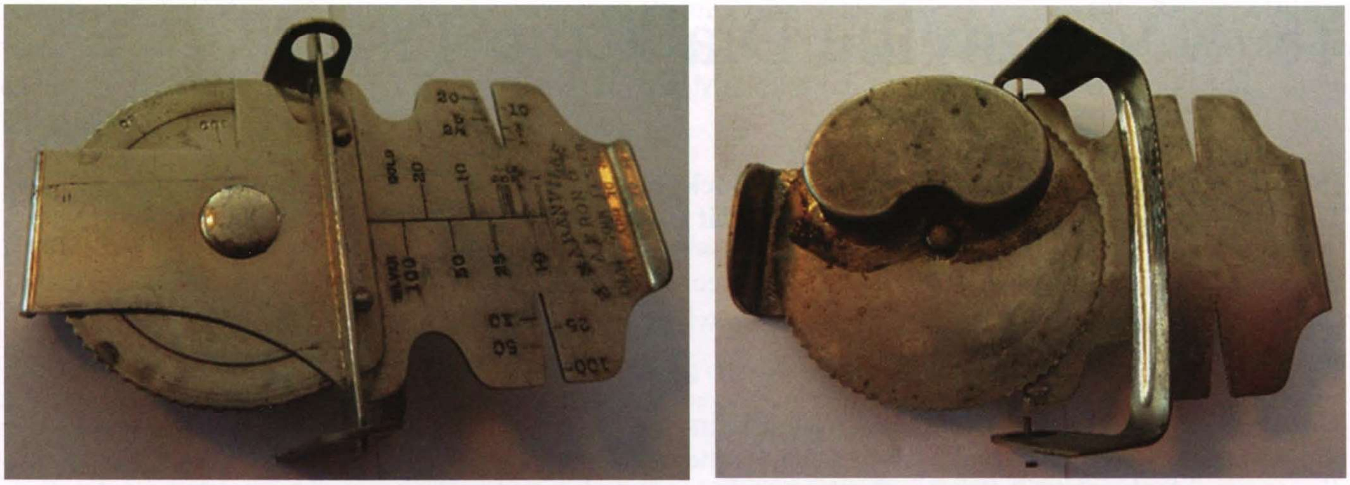
Newman and Mallis observed that while Patent No 203,057 was issued for a combined Postal Scales and Counterfeit Coin Detector, that no such device was known to them. Instead, the third device was the 1878 Dial Coin Tester that came in a "plain black box." This author has located several 1878 Dial Coin Testers in blue boxes, but no black boxes.

The 1878 Dial Coin Tester was sold in a small blue box that would easily fit into a pocket.





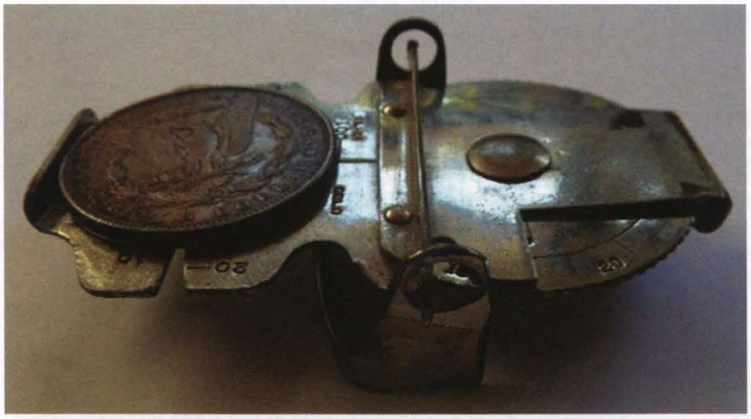
⮙⮚ Dan Hamelberg Collection



▲➤ Dan Hamelberg Collection

DIAL COIN TESTER – DIRECTIONS

Let us test or examine a 50 cent piece. Move the dial to the right with thumb and finger, so that the mark 50 is at index. Place the coin on face at left end, so that the edge touches the lip turned up and it will balance if genuine. Should it appear to be larger than usual you may test the size (diameter and thickness). At left end are two scales, one side for gold and the other for silver coin which will be readily understood. The thickness will vary in coin sizing to milling at edge. It should be tried in about three places, and it will average about the mark set to each coin. Coin worn by handling will measure a trifle less. The danger is in coin measuring larger than the scale indicates. The *jingle* should be tried in doubtful pieces which is always good in genuine coin. All other pieces of gold and silver are tested in the same way.



◄◄ 1878 Maranville Dial Coin Tester (Actual size – 88 mm long, 60 mm wide)

Balancing a genuine US Silver Dollar - Bill James Collection

A genuine coin must satisfy three tests – weight, diameter and thickness. The 1878 Dial Coin Tester provides tests for these three dimensions:

1. The expected diameter is marked for each coin value on the pan area.
   Left is graduated for Silver 100, 50, 25 and 10 cent coins.
   Right is graduated for Gold 20, 10, 5, 3, 2½, and 1 dollar coins.
2. Thickness is tested in the "V" notches cut into the sides of the coin tester.
   Left is graduated for Silver 100, 50, 25 and 10 cent coins.
   Right is graduated for Gold 20, 10, 5, 3, 2½, and 1 dollar coins.
3. The dial is rotated to the mark for the coin being weighed, and it should balance.
   Inner circle on Dial graduated for Silver 100, 50, 25 and 10 cent coins.
   Outer circle on Dial graduated for Gold 20, 10, 5, 3, 2½, and 1 dollar coins.

It should again be noted that Maranville named this device “DIAL COIN TESTER” not a “Postal-Scale and Counterfeit-Coin Detector” as detailed in the Patent documents.

H. MARANVILLE.
Postal-Scale and Counterfeit-Coin Detector.

No. 203,057. **Patented April 30, 1878.**

Fig. 1

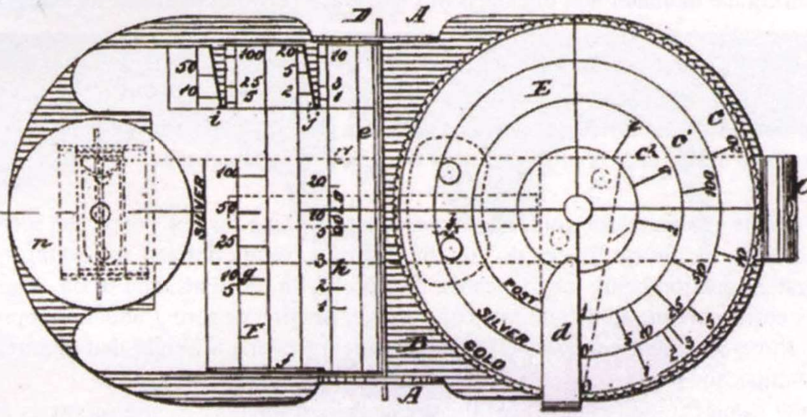
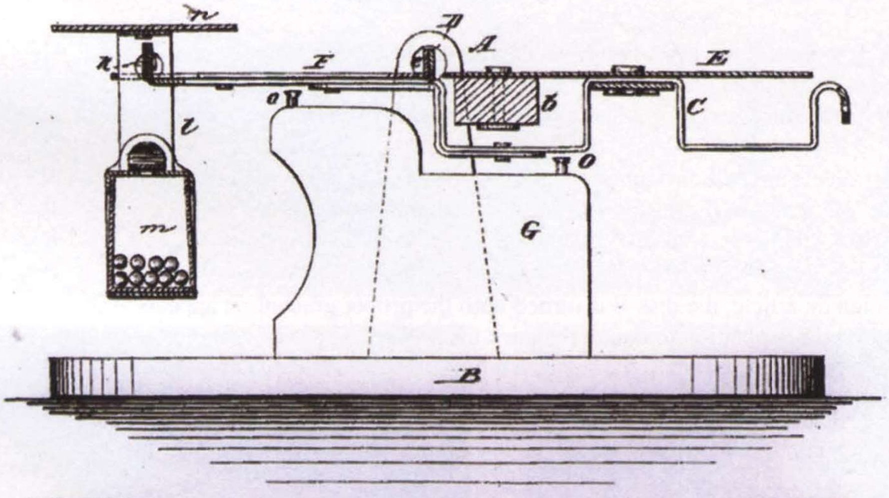


Fig. 2.



WITNESSES:
Francis McArdle.
C. Sedgwick

INVENTOR:
H. Maranville
BY Munn & Co
ATTORNEYS.

UNITED STATE PATENT OFFICE
HARVEY MARANVILLE, OF AKRON, OHIO, ASSIGNOR TO HIMSELF AND SAMUEL D. STEWART, OF SAME PLACE
IMPROVEMENT IN POSTAL-SCALE AND COUNTERFEIT-COIN DETECTOR
Specification forming part of Letters Patent No. 203,057, dated April 30, 1878; application filed March 7, 1878

To all whom it may concern:

Be it known that I, HARVEY MARANVILLE, of Akron, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Scales, of which the following is a specification: Figure 1 is a plan view of my improved scales. Fig. 2 is a longitudinal vertical section. Similar letters of reference indicate corresponding parts.

The object of my invention is to provide scales for testing coin and weighing small articles, more especially coin and mail matter; and it consists in a beam having upon one end a graduated rotating disk, which carries the counterpoise, and upon the other end a scale for measuring the diameter and thickness of coin, and a pivoting platform for receiving the coin or packages to be weighed.

Referring to the drawing, A A are standards projecting perpendicularly from the base B, and C is a beam attached to a cross-bar, D, the edges of which are V-shaped and have a bearing in apertures in the standards A.

A disk, E, is pivoted to the beam C, and carries on its under surface a weight, b. The beam is bent or offset to permit of turning the disk, and the upper face of the disk is provided with three sets of graduations – one set for gold, one for silver, and one for mail matter.

The outer circle, c, on the disk is graduated for gold, the first graduation being for one dollar, the second for two and one-half dollars, the third for five dollars, the fourth for ten dollars, the fifth for twenty dollars, and so on. The second circle, e^1, is graduated for silver, the first graduation being for five cents, the second for ten cents, and so on. The third and inner graduation, c^2, represents weights corresponding to certain rates of postage, the first or zero graduation representing a package having a weight requiring one three-cent stamp, the second graduation representing a weight that requires two three-cent stamps, the third three three-cent stamps, and so on.

An arm, d, is attached to the beam C, and extends over the upper face of the disk E, and serves as an index in adjusting the disk. Upon the opposite side of the cross-bar D there is a plate, F, which is provided with two lips, e f, against which to place the coin in measuring the diameter. The lip e is riveted to the bar D, and the lip f is at right angles to it.

Upon the face of the plate F there are two sets of graduations – one set, g, for silver coin, the other set, k, for gold coin. The graduations for silver coin range from five cents to one dollar, and graduations for gold coin range from one to twenty dollars.

In the edge of the plate F, opposite the lip f, two V-shaped notches, I j, are formed. The notch I, which is for the measurement of the thickness of silver coin, is graduated for five, ten, twenty-five, fifty cents, and one dollar. The notch j is graduated for the measurement of the thickness of gold coin, the graduations being for coins ranging from one to twenty or fifty dollars.

The end of the beam C projects upward through a notch in the outer edge of the plate F, and to it is riveted a bar, k, whose upper edge is V-shaped. A stirrup, l, having apertures for receiving the ends of the bar k, is supported by the said bar, and has attached to it, below the pivot, a box, m, for containing shot or sand for adjusting the scale and for keeping the stirrup in a vertical position. A disk, n, is attached to the upper end of the stirrup, for receiving coin or other articles to be weighed.

When it is desired to weigh an article, the disk E is turned until the proper graduation appears at the indicating – bar d, when the weight b will be in the proper position to counterbalance the article. Coin is measured to thickness by the V-shaped notches i j, and its diameter is measured upon the scales g h by placing them against the lip f.

A block, G, is placed under the beam C, and in it there are two screws, o, one each side of the bar D, for limiting the motion of the beam.

The advantages claimed for my improved scale are that it is convenient, simple, and accurate, and, as all of the parts are connected together, none of them can become lost.

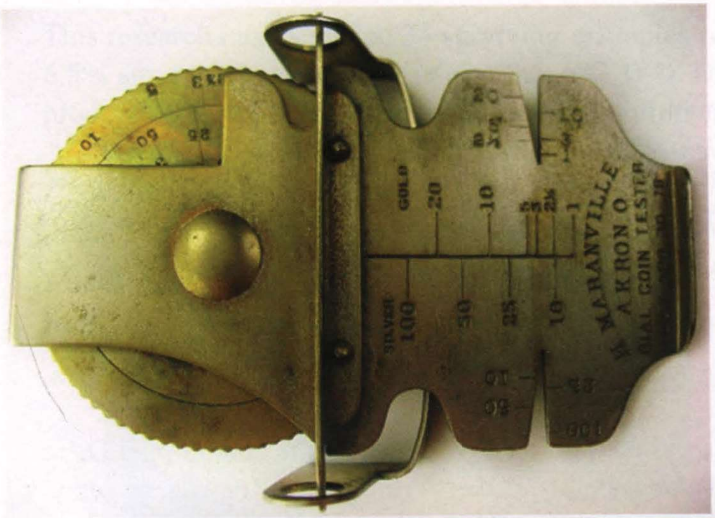
Having thus described my invention, I claim as new and desire to secure by Letters Patent –

In scales, the beam C, having an upwardly convex middle bend that supports on a pivot the disk E, and concavities on each side that allow the passage of a weight, b, as set forth.

The combination of the graduated disks E and plates F, supported on beam C, the former having weight b, and the latter a stirrup, as and for the purpose specified.

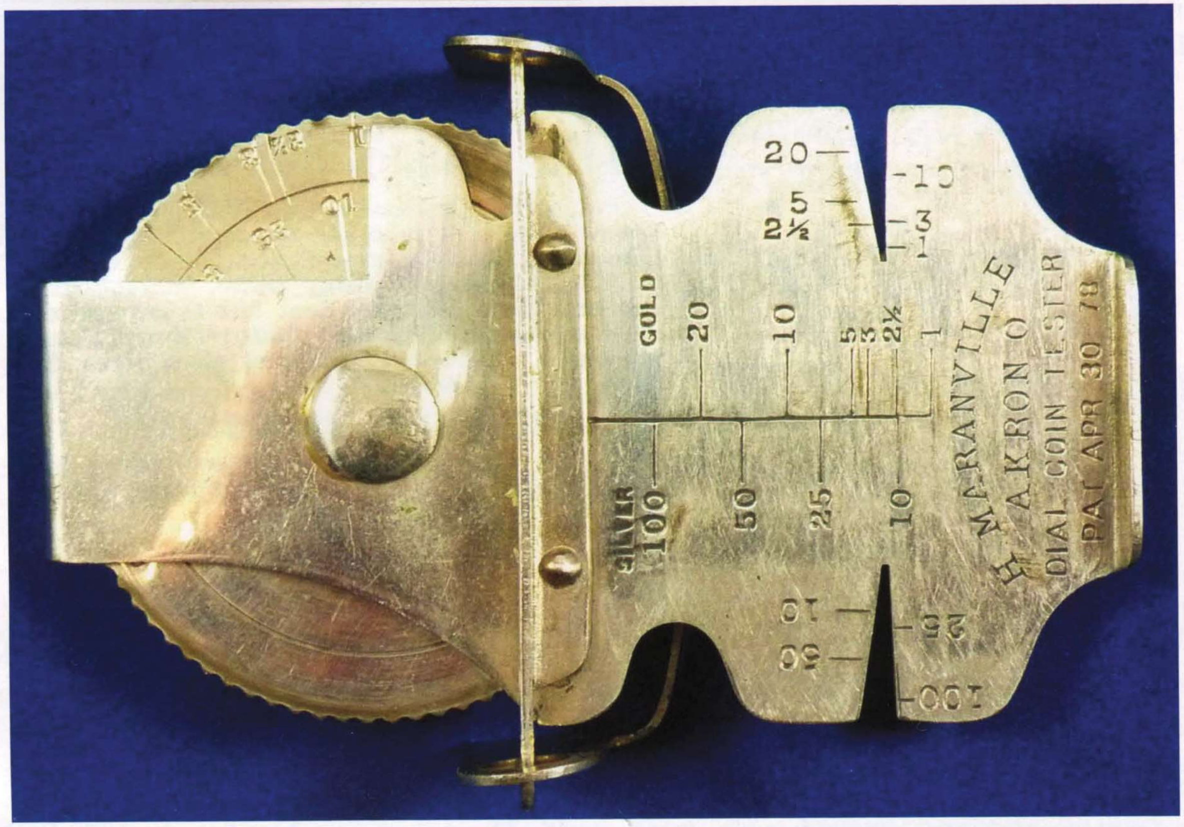
HARVEY MARANVILLE

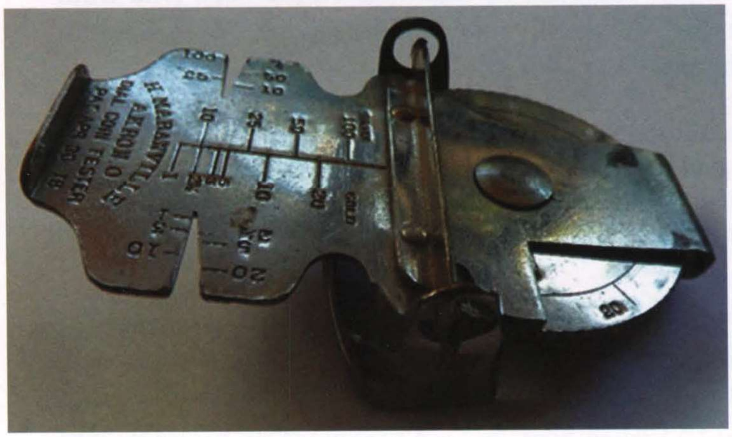
Witnesses: GEO. G. ALLEN
G. S. SCOTT



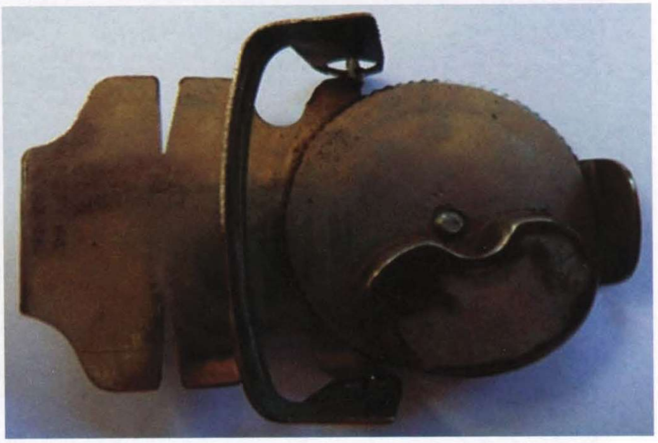
≺≺ Eric & Judy Soslau Collection Actual Size shown (88 mm long, 60 mm wide, disk diameter 50 mm.)

⋎⋎ Berning Collection – larger than actual size to show graduations for both coin diameter and coin thickness for both Gold and Silver coins.





⋏⋏Bill James Collection: shows see-saw action resting on stand .



⋏⋏ Bill James Collection: shows rotating weighted disc and stand underneath.

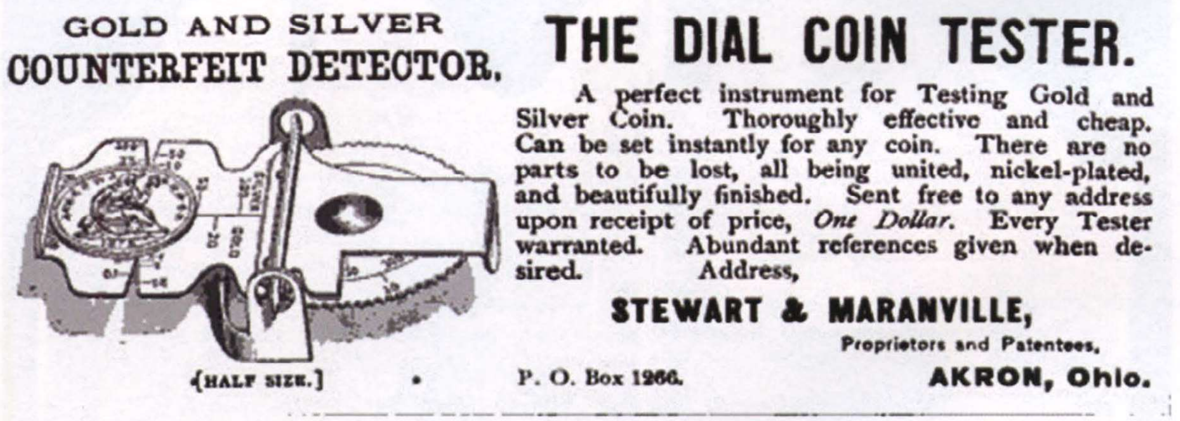
Period Advertisements for the Dial Coin Tester

Scientific American announced Maranville's third Patent in the July 6, 1878 edition.

> *Mr Harvey Maranville, of Akron, Ohio, has invented Scales for testing coin and weighing small articles, more especially coin and mail matter. A beam is provided at one end with a graduated rotating disk, which carries the counterpoise, and at the other end with a scale for measuring the diameter and thickness of coin, and a pivoted platform for receiving the coin or packages to be weighed.*

It is quite clear that *Scientific American* relied on the Patent specifications for their article as there is no evidence that Scales for "mail matter" were ever made by Maranville.

It is interesting to note that Patent No 203,057 assigns rights to both Harvey Maranville and Samuel D. Stewart, both of Akron, Ohio. An early 1879 advertisement in the Bankers Almanac & Register shows Stewart & Maranville to be Proprietors and Patentees. The advertised price was One Dollar, sent free to any address:



GOLD AND SILVER
COUNTERFEIT DETECTOR.

(HALF SIZE.)

THE DIAL COIN TESTER.

A perfect instrument for Testing Gold and Silver Coin. Thoroughly effective and cheap. Can be set instantly for any coin. There are no parts to be lost, all being united, nickel-plated, and beautifully finished. Sent free to any address upon receipt of price, *One Dollar.* Every Tester warranted. Abundant references given when desired. Address,

STEWART & MARANVILLE,
Proprietors and Patentees,
P. O. Box 1966. AKRON, Ohio.

▲▲ *Bankers Almanac & Register for 1879*, N.Y. - 1879 advertisement p.39

Samuel D. Stewart was a dentist in Akron, Ohio. In 1863, Harvey Maranville was appointed under the United States Internal Revenue system, Inspector and Gauger of distilled and malt liquors and illuminating oils, for Summit County, Ohio. Maranville held his Inspector and Gauger position until about 1878, about eleven years before his death on January 12, 1889.

Samuel D. Stewart is not mentioned on the device itself. There are no markings on the 1878 Dial Coin Tester to indicate who made the device – "H Maranville" is the only name on the device. We are left to wonder who made the 1878 device for Stewart & Maranville.

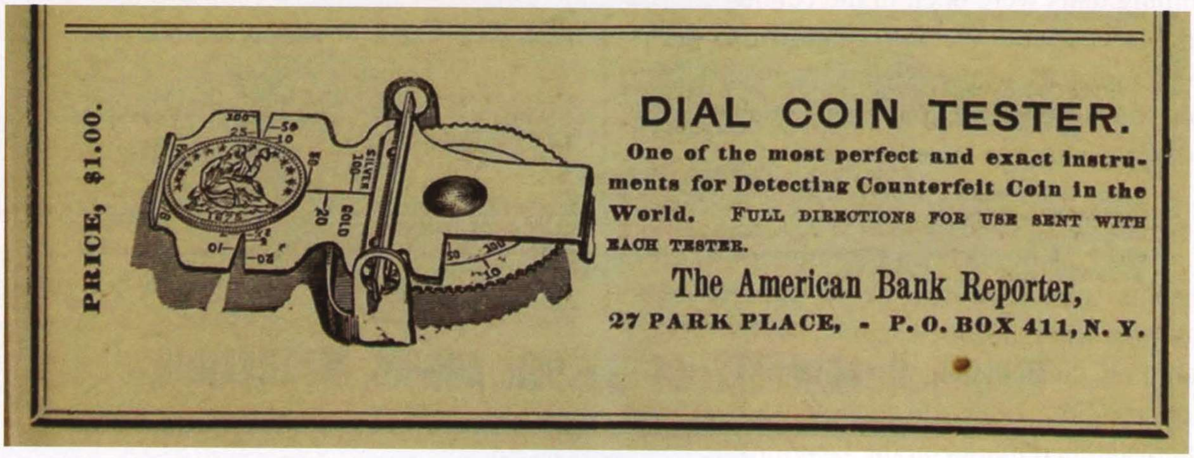
We are also left to wonder what Samuel D Stewart contributed to the enterprise. Was Stewart an investor who helped finance the project? Did Stewart come up with the idea of the "dial" counterweight where Maranville had previously used brass beams to provide the counterweight. Did Stewart have the manufacturing experience to make the 1878 devices for Maranville? Perhaps further research might answer some of these questions in the future.

There are no "serial numbers" like those on the 1857 Maranville Coin Tester to indicate production numbers. However, the surviving serial numbers on the 1857 Maranville suggested six production runs of 100 each to produce a total of 600 examples of the 1857 coin tester: i.e: 39 x 1857 Maranville Coin Testers are known to have survived (6.5%).

This research has identified 34 surviving examples of the 1878 Dial Coin Tester. If we assume the same 6.5% survival rate it would suggest that 523 1878 Dial Coin Testers were originally made, probably six production runs of 100 each again, for a total of 600 again.

Stewart and Maranville advertised the Dial Coin Tester for sale at One Dollar in 1879. The device was available directly from them at P.O. Box 1266 Akron, Ohio.

A later 1890 advertisement in *Underwood's Counterfeit Reporter* shows the Dial Coin Tester being sold for $1 by The *American Bank Reporter*, 27 Park Place, New York.



PRICE, $1.00.

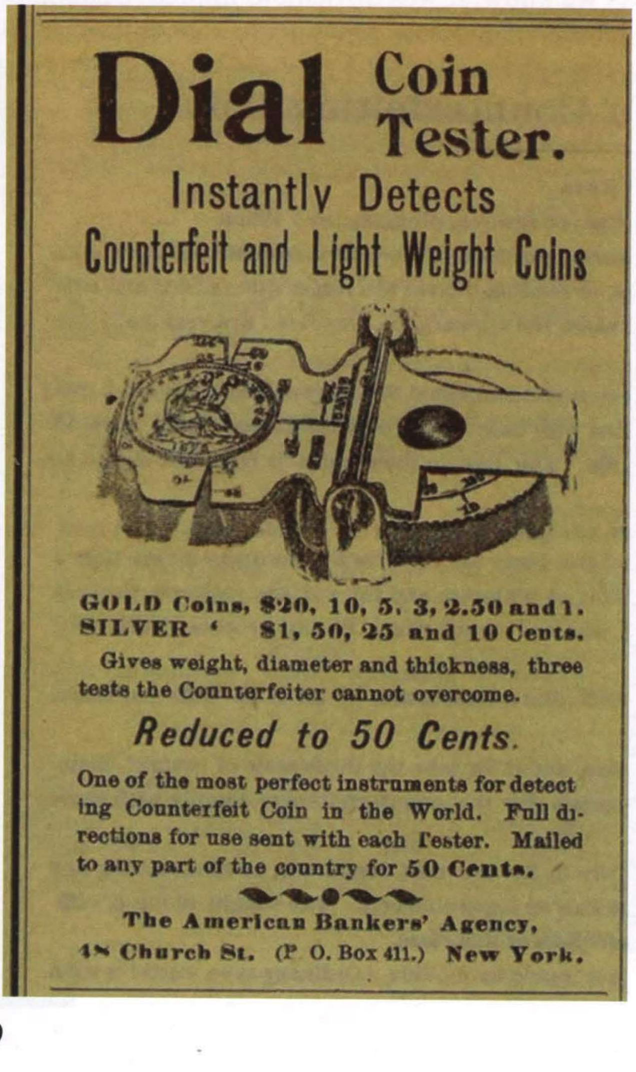
DIAL COIN TESTER.

One of the most perfect and exact instruments for Detecting Counterfeit Coin in the World. FULL DIRECTIONS FOR USE SENT WITH EACH TESTER.

The American Bank Reporter,
27 PARK PLACE, - P. O. BOX 411, N. Y.

▲▲ *Underwood's Counterfeit Reporter*, New York City, V 13, No 5, Sept Oct 1890, p.4

Finally, the Dial Coin Tester has been reduced to a price of 50 cents, and available in 1895 from *The American Bankers Agency*, 48 Church Street, New York.



Dial Coin Tester.

Instantly Detects
Counterfeit and Light Weight Coins

GOLD Coins, $20, 10, 5, 3, 2.50 and 1.
SILVER " $1, 50, 25 and 10 Cents.

Gives weight, diameter and thickness, three tests the Counterfeiter cannot overcome.

Reduced to 50 Cents.

One of the most perfect instruments for detecting Counterfeit Coin in the World. Full directions for use sent with each Tester. Mailed to any part of the country for 50 Cents.

The American Bankers' Agency,
48 Church St. (P. O. Box 411.) New York.

➤➤ *Underwood's Counterfeit Reporter*, V 18, No 5, Sept & Oct 1895, p.48

Marking of Weights and Scales

BY VITALY TOMCHYK

Peculiarities of stamping verification marks on beams and weights in the Russian Empire

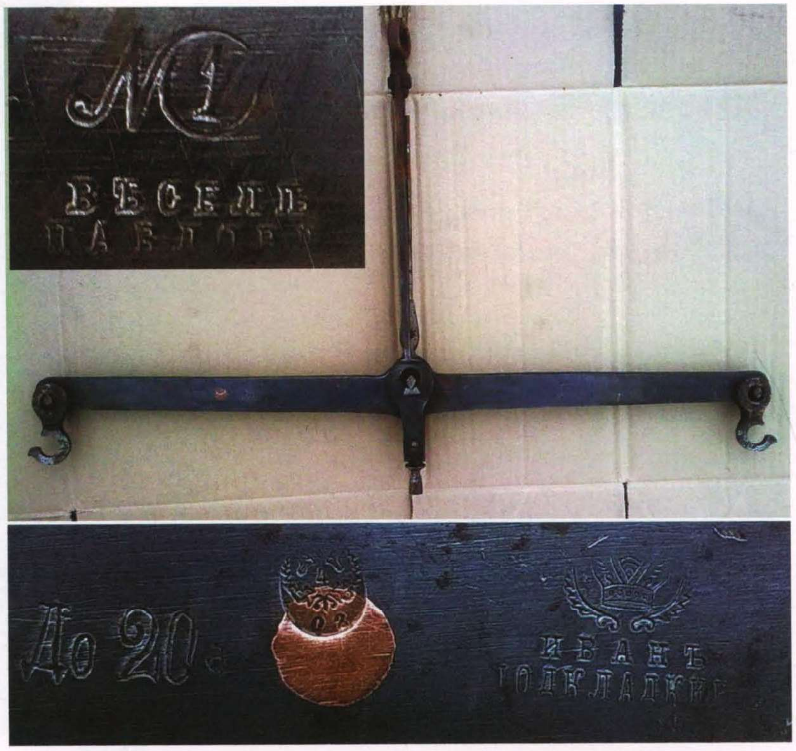
The history of the first hallmark stamping tents in the Russian Empire goes back to the year 1900 when five stamping tents were open in the country. Four of them were located in the capital centers of St. Petersburg, Moscow and Warsaw. The fifth stamping tent was opened in the village of Pavlovo of the Gorbatovsky district in the Nizhny Novgorod Province. It was dictated by the need to stamp weight stamps on thousands of weighing units manufactured by hundreds of workshops of the Province. At that time, the beam balances were subject to mandatory stamping – i.e. primary and periodic branding.

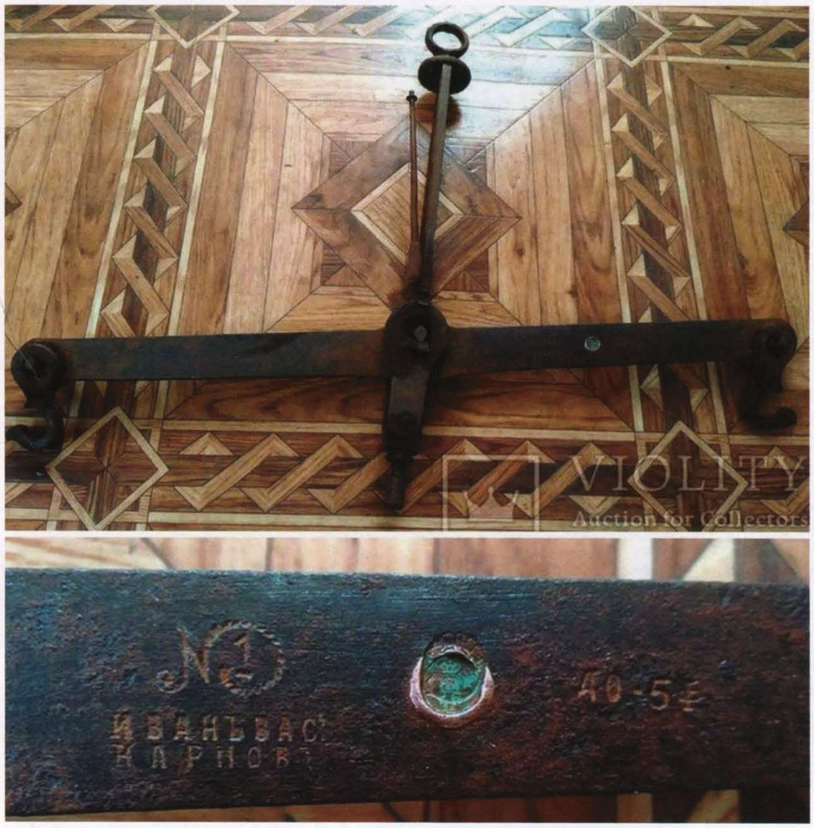
Weight stamping cost money and besides, the overworked stamping tents could not cope with a huge amount of work to do, delaying stamping and consequently commodity turnover, for months. Usually, weigh beams were provided for stamping by wholesalers and/or resellers, who then sold the scales throughout the Russian Empire and outside the country. The balance beams producers were not interested in stamping, since the number of its production was rather limited. As the result of that, the resellers, trying to save both time and money, had resorted to various illegal acts, such as: they ordered fake stamps and stamped marks on the weighing units themselves.

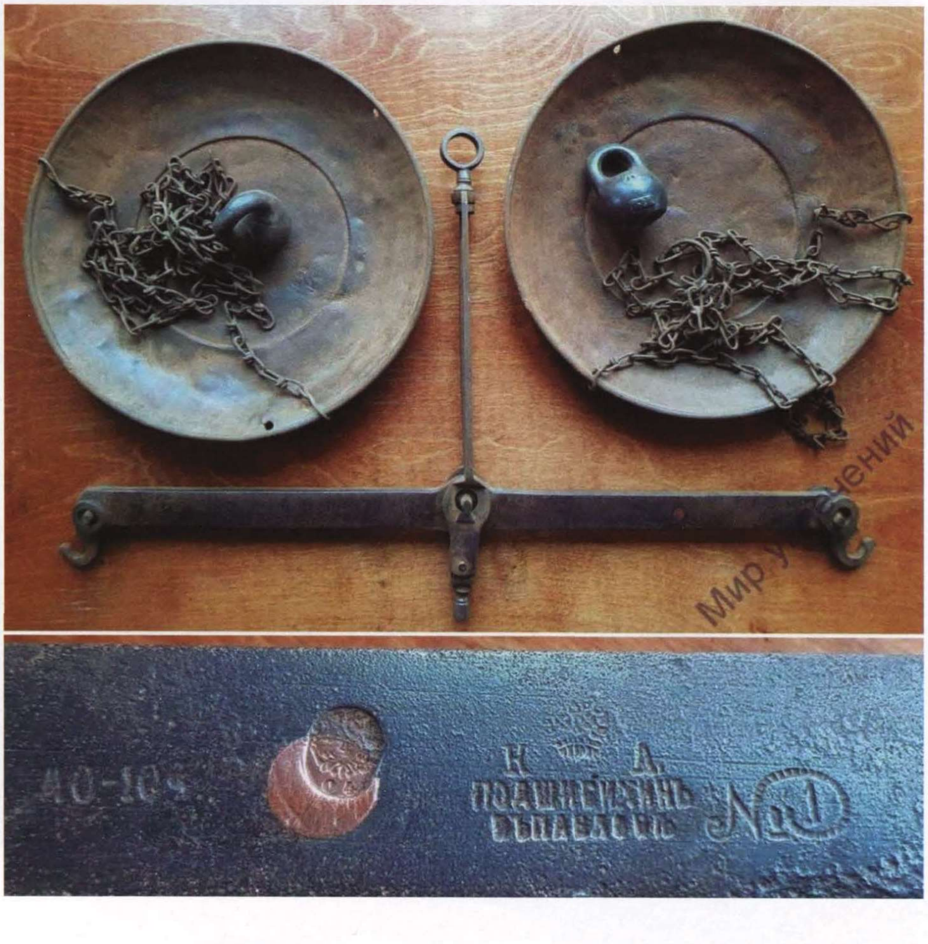
As we know, it was difficult to impress a stamp on a steel balance beam, because the mark was not clear, and the stamp wore out quickly. Therefore, copper inserts (plugs) were provided on balance beams and weights to stamp marks. Stamping the weights was cheaper than stamping the balance beams, as the process of stamping weights took less time.

Thus, second-hand dealers practiced simultaneous stamping of hundreds of weights, after which copper plugs were taken from weights and rearranged on balance beams, while the weights were furnished with new inserts to be stamped once again. The marked plugs were removed and from the obviously unusable and broken balance beams transferred to new ones. In this regard, people dealing with stamping, came up with a little trick. The stamp on the copper insert was imposed in such a way that part of the stamp fell on the insert and part on the beam's arm or a weight's body. This, made it impossible to transfer the inserted plug with such a stamp to another beam or weight.

Here and on the next pages, I give examples of this, at first glance, careless, but in fact filled with deep meaning. A way of stamping marks on balance beams, for you to see everything with your own eyes.







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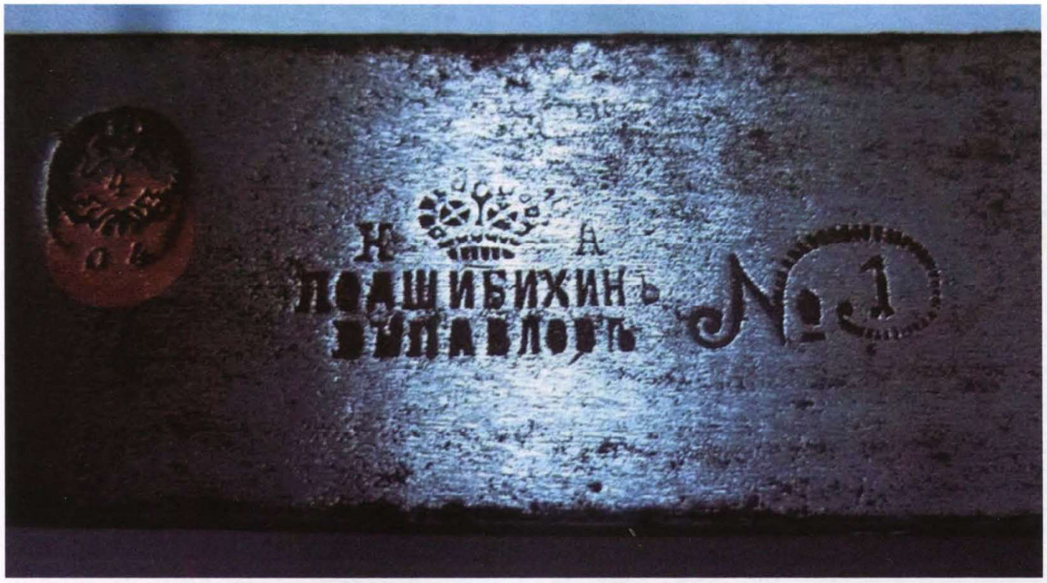
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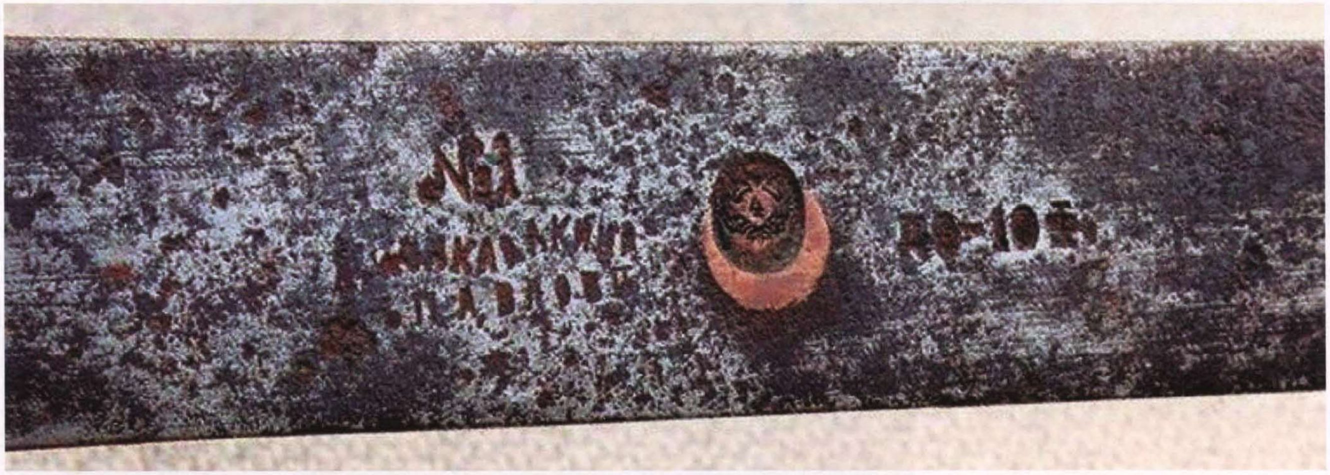
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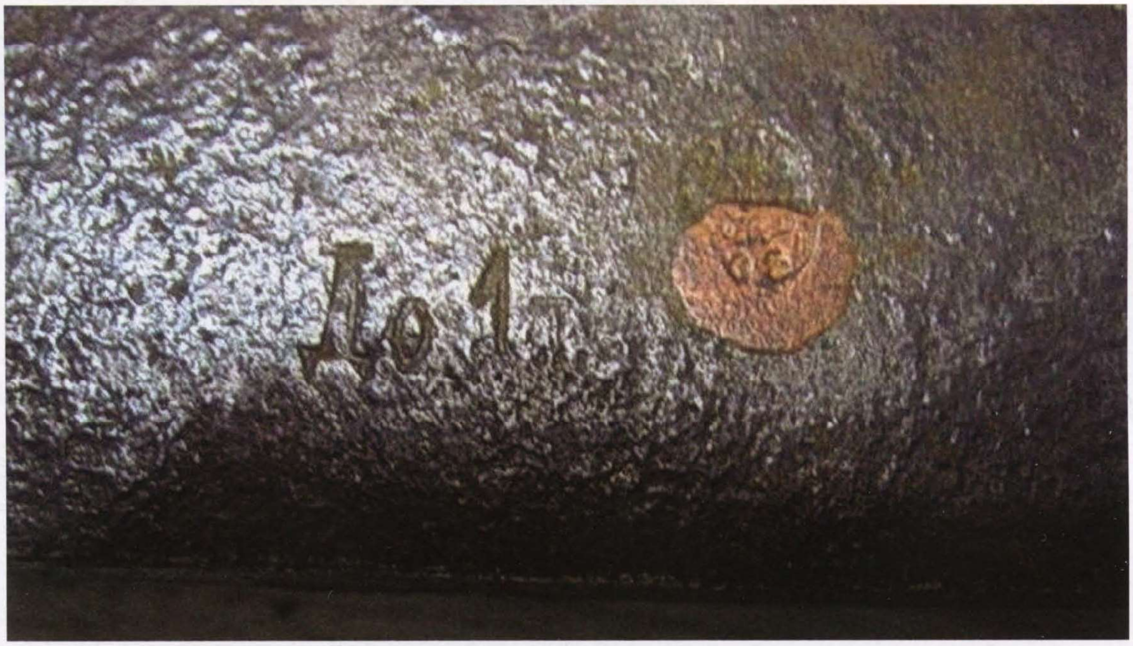
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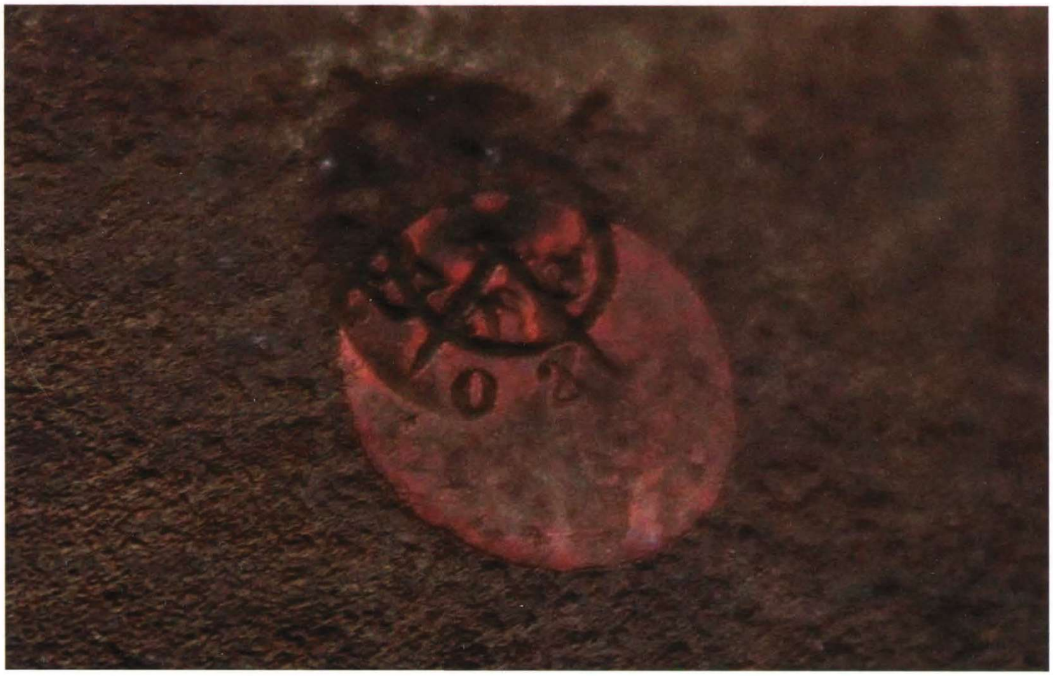

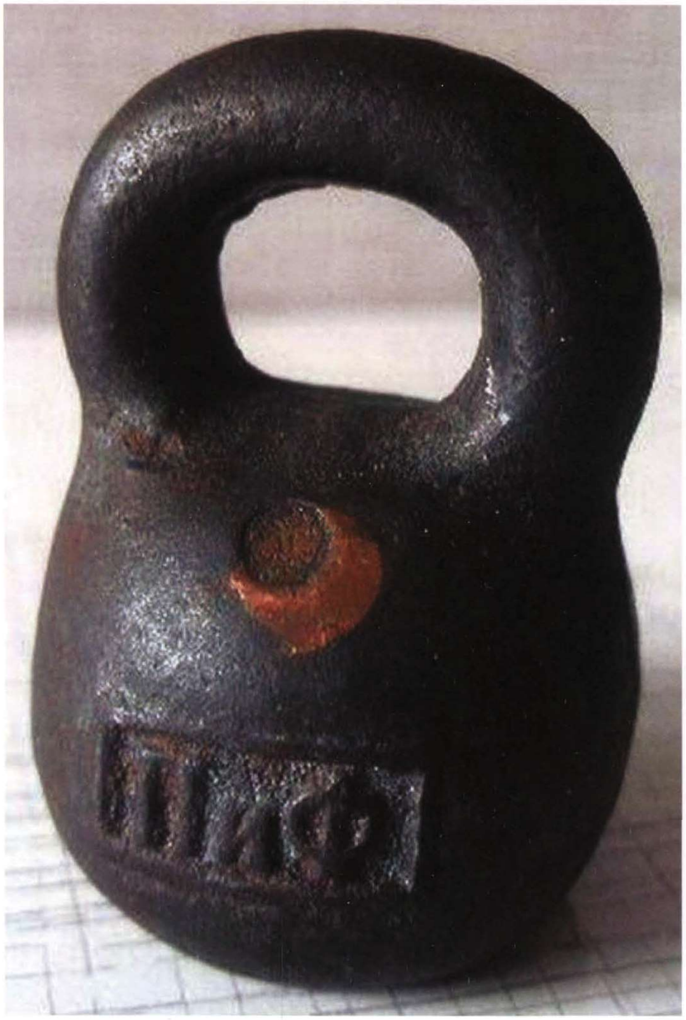

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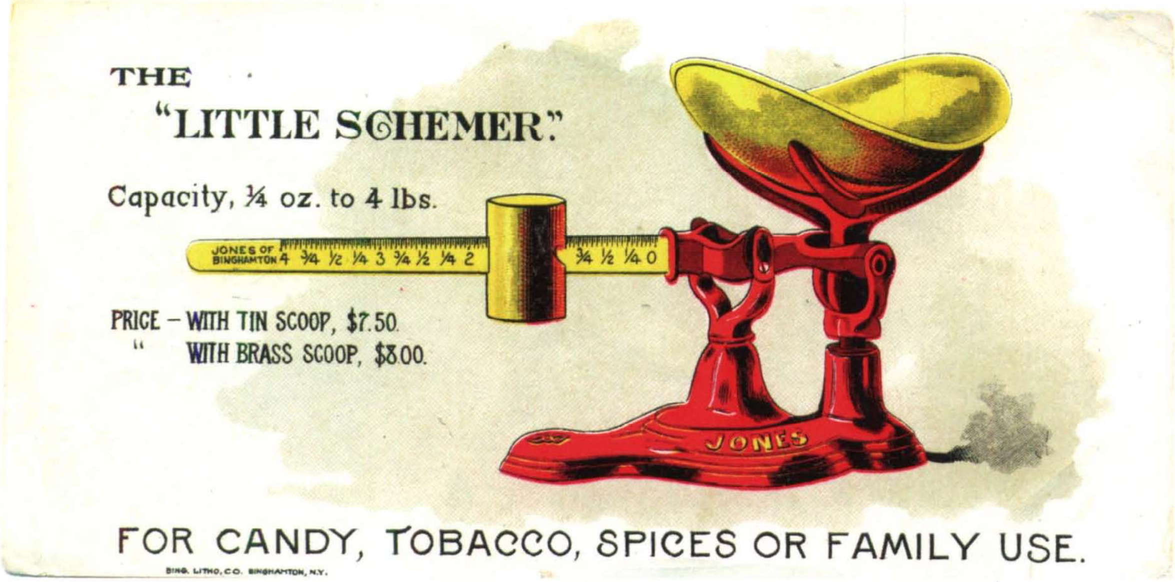
Old Advert



THE

"LITTLE SCHEMER."

Capacity, ¼ oz. to 4 lbs.

PRICE – WITH TIN SCOOP, $7.50.

" WITH BRASS SCOOP, $8.00.

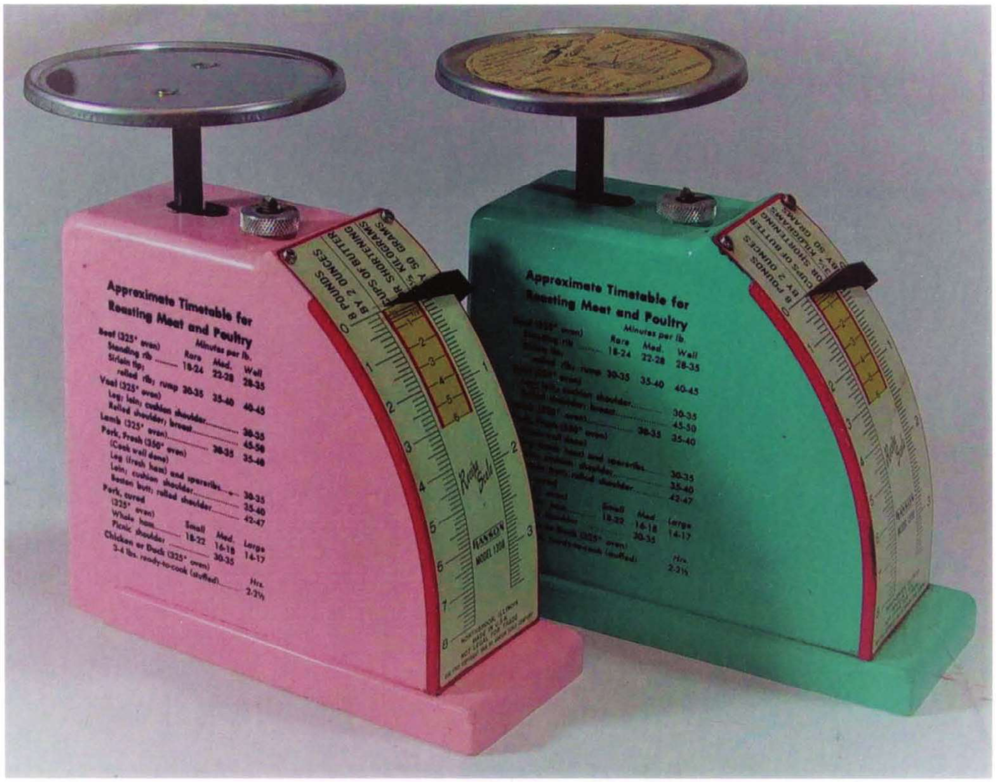
FOR CANDY, TOBACCO, SPICES OR FAMILY USE.

BING. LITHO. CO. BINGHAMTON, N.Y.

JONES OF BINGHAMTON 4 ¾ ½ ¼ 3 ¾ ½ ¼ 2
¾ ½ ¼ 0
JONES

Advert for The "Little Schemer" Capacity, ¼ oz. to 4 lbs. Price—with tin scoop, $7.50, with brass scoop, $8.00. For Candy, Tobacco, Spices or Family Use. Card printed by Bing. Litho. Co. Binghamton, N.Y. Printed on thin paper, it measures 6 by 3 inches. The scale was manufactured by Jones of Binghamton, N.Y.

Showcase



These two plastic Hanson Recipe Scales were manufactured by Hanson Scale in Northbrook, IL, a Chicago suburb. These are the two rarest colors of pink and aqua to match popular 1940s and 1950s kitchen colors. The scale was also made in yellow, red and white. The dial face is copyright 1948, one side gives a timetable for roasting meat and poultry while the other gives equivalent weights and measures for staples.

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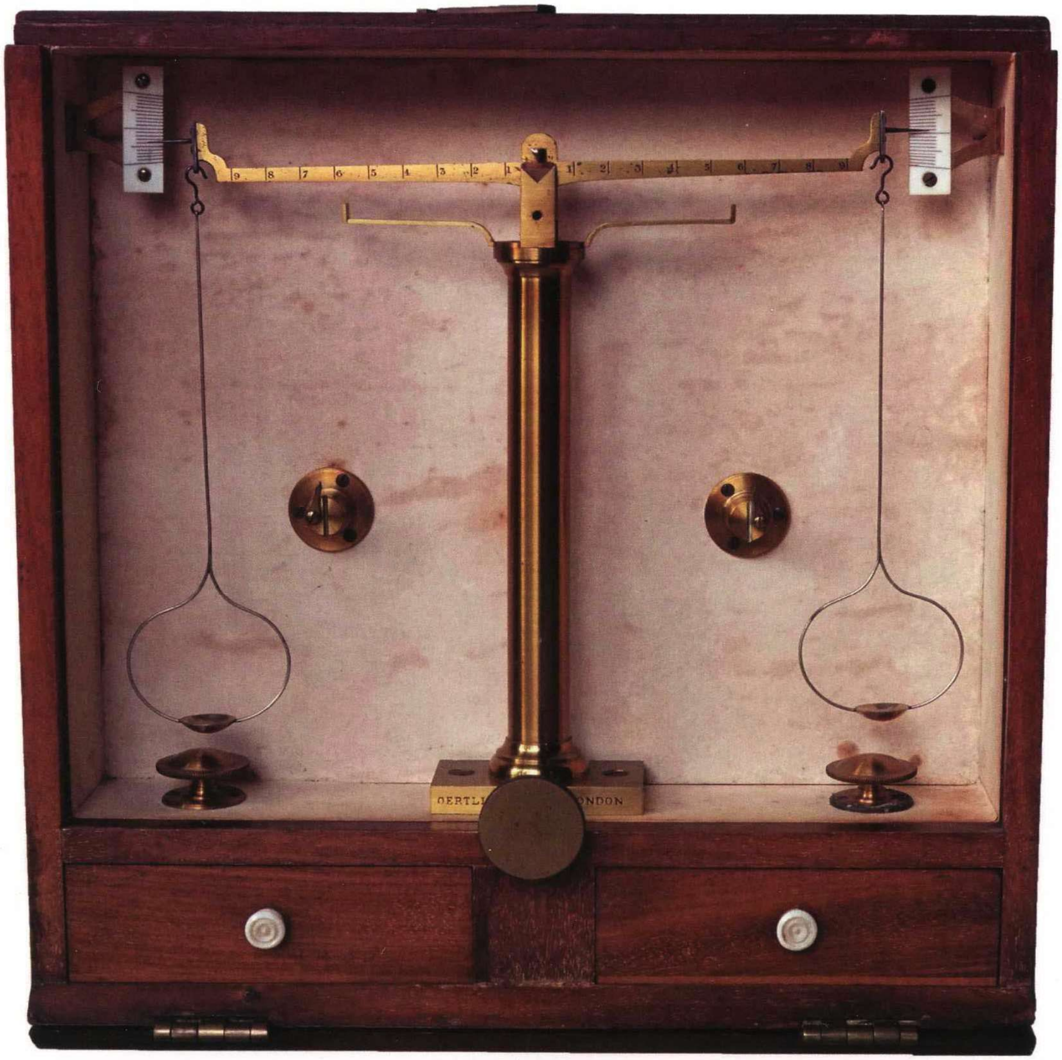
2021 ISSUE NO. 2 PAGES 4805 - 4832



Cover Picture

Oertling Assay Balance Model 15 was shown on page 30 of Oertling's 1909 catalogue. It was complete with a leather case with a shoulder strap in which to carry the balance. The balance had a six inch brass beam and its case measured 8 inches square by 2 inches deep. This diminutive balance was made to weigh the gold "buttons" produced in the fire assay of gold. For this reason assay balances were often known in America as Button Balances. Capacity 2 grammes in each pan.

See pages 4828-4831 of this issue for more info.

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Photos are best in 300 DPI Jpegs in a separate file with a maximum of 3 photos per Email.

Six Ways to Weigh the Ducat

BY STEPHEN BARNETT

One of the things that fascinates me about scales is the ingenuity and skill that scale makers have demonstrated for creating a scale to weigh one thing, in this case the gold ducat. Furthermore, the main purpose of the scale is not to determine the weight of the coin but rather how its weight differs from the correct weight, i.e. the weight of the coin when it was minted.

The word *ducat* is from Medieval Latin *ducalis* = "relating to a duke (or dukedom)", and initially meant "duke's coin" or a "duchy's coin". It was first minted in Venice in the middle of the 13th century, and was 3.545 grams of 99.47% fine gold, the highest purity medieval metallurgy could produce[i]. It was used for trading, goods for gold and gold for goods.

The ducat was not used as day-to-day currency. Rather it was used in trade. For example, Holland built ships that were designed to carry bulk grain between various ports on the Baltic Sea. The traders used ducats to buy and sell their cargo. Since the ducats minted in the various countries were roughly the same weight (about 3.5 grams, or 54 grains, or 3 pennyweight and 5 ¾ grains), they were probably accepted without doing any form of conversion. The concern was more likely to be how much of the gold was lost from use of the coin, or possibly from being shaved, and at what weight was the coin no longer acceptable. An analysis of several scales that were designed to check the weight of the ducat helps to suggest what the least acceptable weight was.

Virtually every east European country or principality minted their version of the ducat, each with the same weight and purity of gold. Most of them minted the ducat and double ducat coin as well as the fractional ducats: one half, one quarter, one eighth, one sixteenth and even one thirty-second. The one thirty-second coin weighed about 1.4 grains! At the end of this article we offer an explanation of why these fractional coins were minted and how they were used. Because the Netherlands did extensive international trading using the Dutch East India Company, the ducats that they minted set the standard for uniformity of size, weight and purity of gold. (Figure 1 and Figure 2 the Dutch Gold Ducat; Figure 3 and Figure 4 the Dutch Double Ducat; pictures courtesy of Heritage Auction HA.com) Some countries such as England, France and Portugal did not mint ducats presumably because they minted their own gold coin which was about the same size and weight as the ducat which could be used for trade[ii].

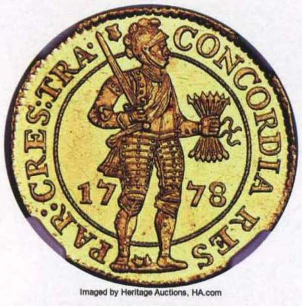


Figure 1. ≺≺ 1778 Dutch Ducat obverse.

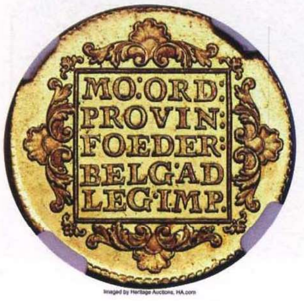


Figure 2. ≺≺ 1778 Dutch Ducat reverse.

Photos courtesy of Heritage Auctions, HA.com

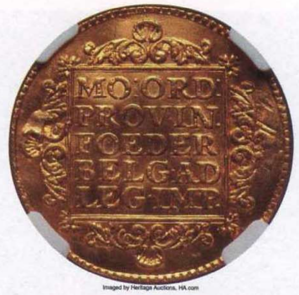


Figure 3. ➢➢ Holland Provincial gold two Ducat 1760 obverse.

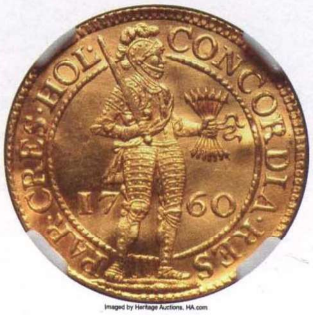


Figure 4. ➢➢ Holland Provincial gold two Ducat 1760 reverse.

Photos courtesy of Heritage Auctions, HA.com

Ducat Weights in European Coin Scale Boxes

Many of the coin scale boxes made in the 17th and 18th century contain weights for the ducat and its multiples or fractions. Figures 5a, b & c show the ducat weights in Dutch, German and Italian coin scale sets. The arrows on the picture of the Italian box points to the Dutch ducat weight on the left and the Hungarian ducat weight on the right. The coin weight was put on one of the pans, and the coin on the other. If the coin was the correct weight, the beam balanced. If the coin was lighter than the weight, sheet grain weights[iii], were added to the pan with the coin until the beam balanced. This determined how much lighter the coin was in grains compared to the weight. Presumably if the coin was too light, it was rejected, cut in half and eventually melted down.

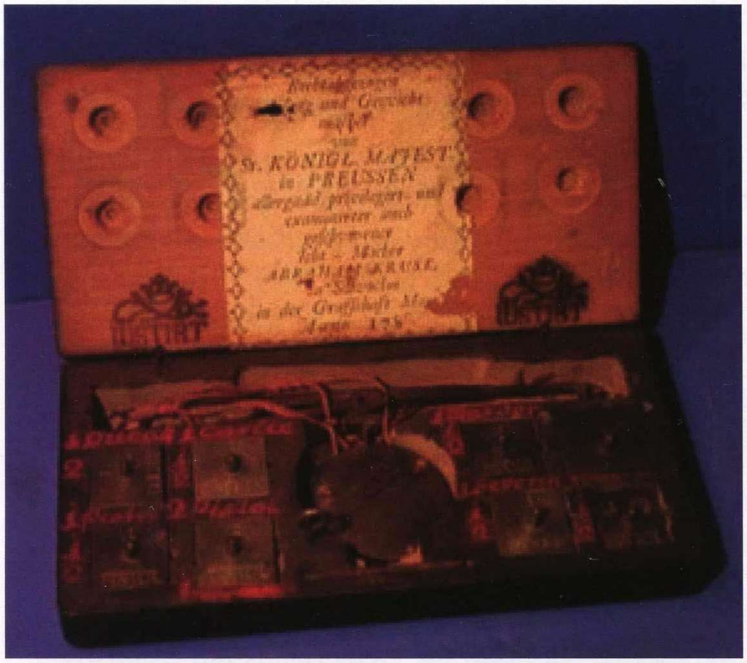

Verzeichnisse … und Gewichte … Sr. KÖNIGL MAJEST in PREUSSEN … ABRAHAM KRUSE … in der Grafschaft Mar… Anno 175…

Figure 5a. ⮝⮝ German coin scale made by Abraham Kruse with ducat weights.

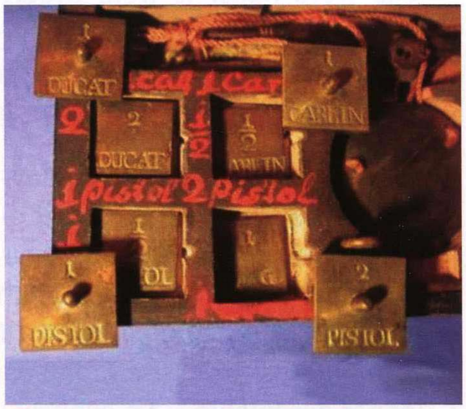


Figure 5a. ➤➤ Detail of weights in box shown at left.

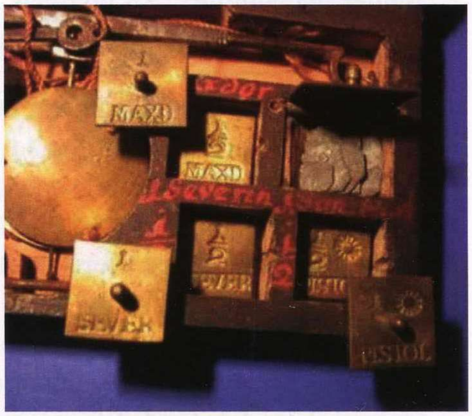


Figure 5a. ➤➤ Detail of weights in box shown at left.

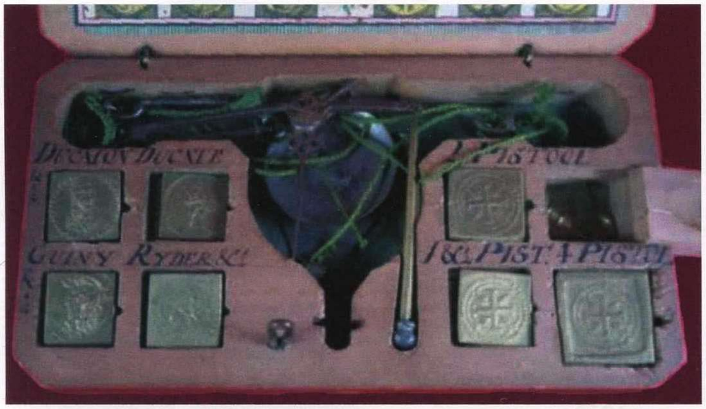


Figure 5b. ⮝⮝ Dutch coin scale set with ducat weights.

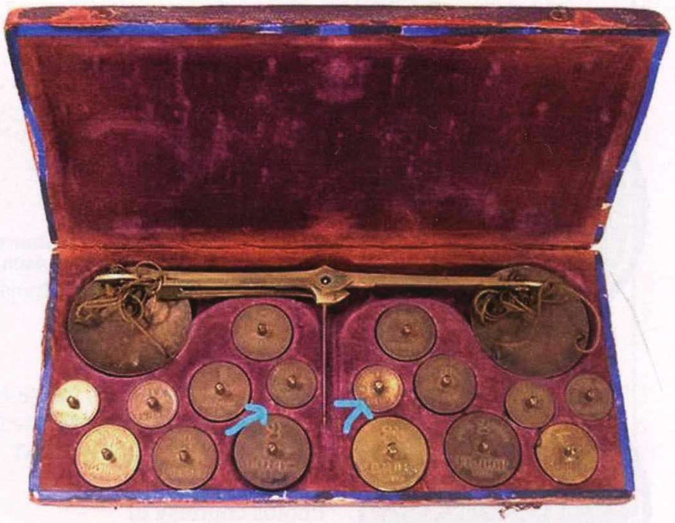


Figure 5c. ⮝⮝ Italian coin scale set with ducat weights.

Ducat Scales

There are five known examples of scales that were made to weigh the ducat. They are small and portable, probably ideal for traders to carry with them to check all or a sample of the ducats that they would receive in trade for their goods.

The Hungarian ducat scale

The Hungarian ducat scale was made by Paulus Deinart (1736-1783) in Nuremburg between 1758 and 1783. (See EQM 1983 Issue 2.) It is a beam scale with one of the pans preloaded with the weight of a Hungarian ducat. (Figures 6, 6a, 7 and 8) Figures 6 and 6a are from the author's collection. Figures 7 and 8, courtesy of Judy and Eric Soslau, show the label inside the box lid. The coin being tested is placed in the other pan. The six notches on the indicator arc measure how much below correct weight the coin is. By experimenting with grain weights, I determined that each notch represents a loss of one grain of weight. For a correct weight coin, the arrow points to the top of the arc. (Figure 9) With 50 grains on the load pan, the arrow points to the fourth notch from the top. (Figure 10) With 54 grains on the load pan, the arrow points to the lowest notch on the arc. (Figure 11) This probably represents the least acceptable weight for the coin. With 48 grains on the load pan, the scale slightly tilts and the pointer points below the lowest notch on the arc, indicating that the coin's weight was less than 48 grains and was therefore unacceptable.

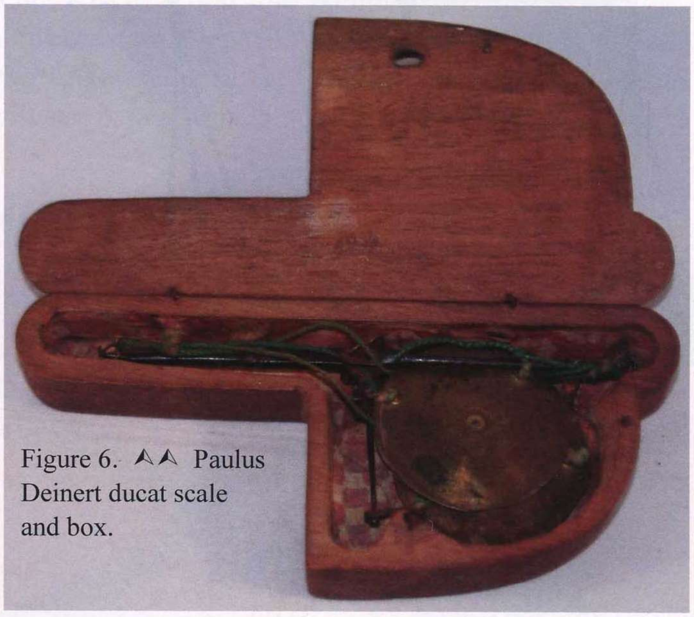


Figure 6. ⩓⩓ Paulus Deinert ducat scale and box.

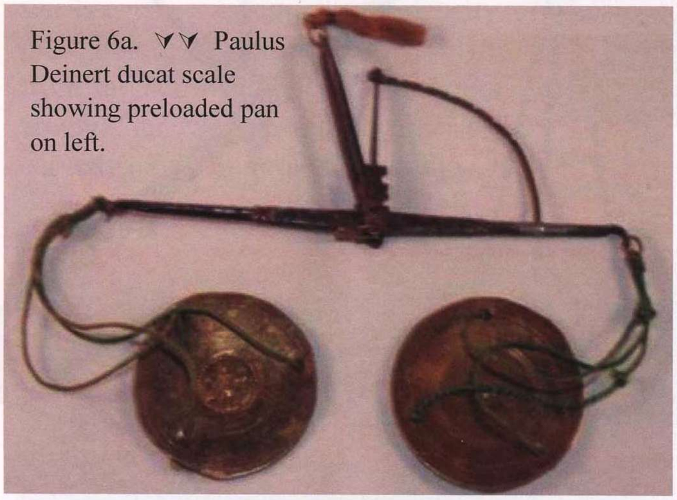


Figure 6a. ⩔⩔ Paulus Deinert ducat scale showing preloaded pan on left.

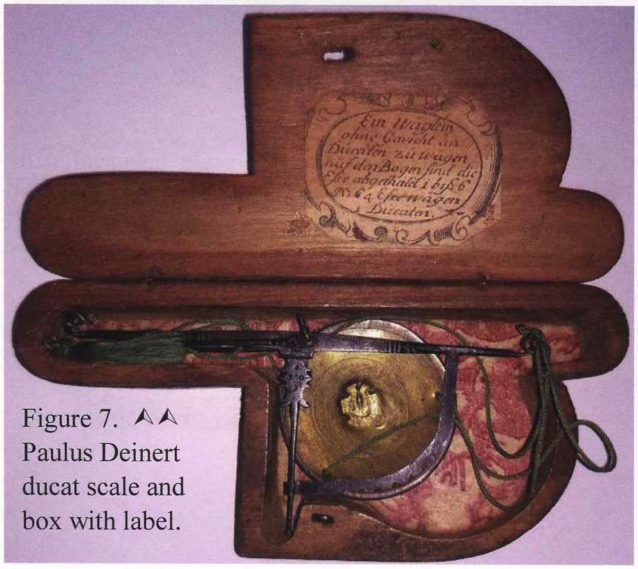
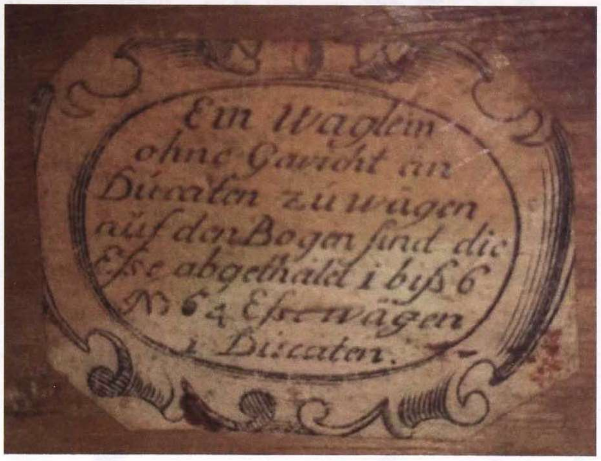


Figure 7. ⩓⩓ Paulus Deinert ducat scale and box with label.



Ein Wäglein
ohne Gavicht ein
Ducaten zu wägen
aüf den Bogen ſind die
Eſſe abgethald 1 biſs 6
№ 64 Eſſe wägen
1 Ducaten.

Figure 8. ⩓⩓ Paulus Deinert ducat scale label..

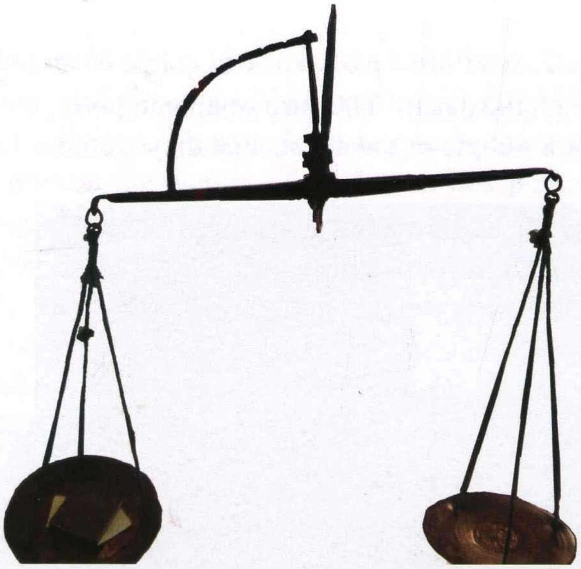


Figure 9. ≺≺ Paulus Deinert ducat scale balanced with 54 grains. The pre-loaded pan is on the right.

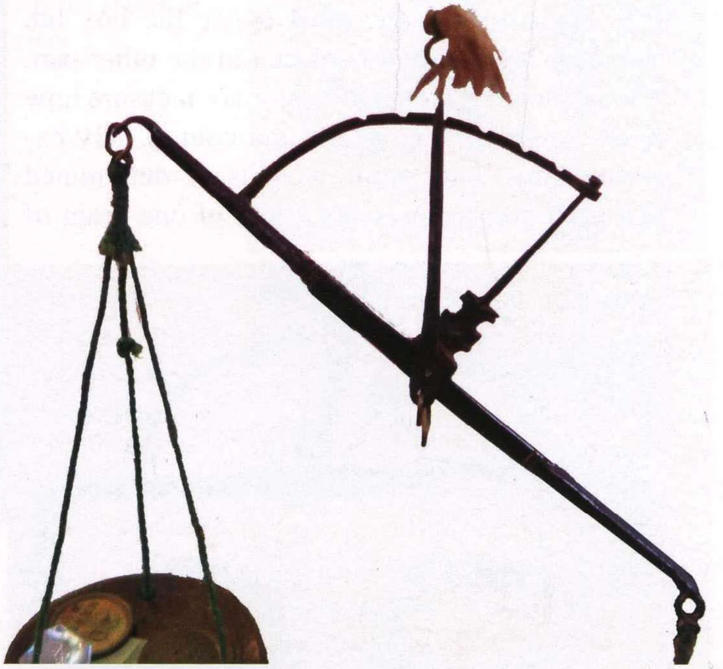


Figure 10. ➢➢ Paulus Deinert ducat scale balanced with 50 grains in coin pan.

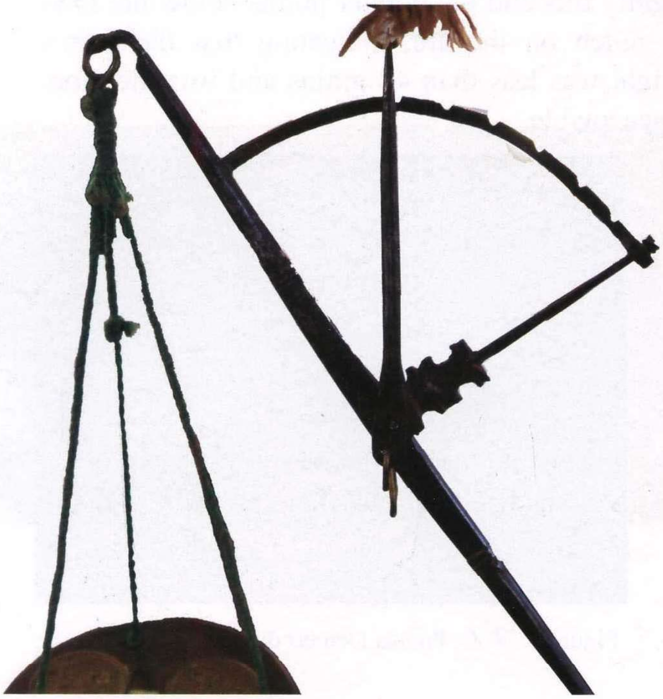


Figure 11. ≺≺ Paulus Deinert ducat scale balanced with 48 grains in coin pan.

With the help of online translation software and my college German, a translation of the label is something like *A scale without weight to weigh ducat [and] on the arch the ducat's lost "esse" weight from 1 to 6 "esse".* What is an "esse"? Utz Schmidt in an email pointed out that there is a coin weight unit in Germany, the Ass or Esschen, which is about .05g. Kisch, *Scales and Weights, A Historical Guide*, page 238 provides additional information about the metric equivalent for the Ass or Esschen in various parts of Germany. All are about .05g. From the conversion table in the Crawforth's *Handbook of Old Weighing Instruments*, .05g = .77 grains. As we will see below, this is not the only scale that possibly was graduated in Esschen.

Cruciform Scale by C. Hasenbein from Muhlhausen

The second example is a cruciform style balance with two overlapping brass poises. (Figure 12) The beams are made from ebony and is 13.7 cm long. The coin platter is 1.9 cm wide and 2.3 cm long. The poise end of the beam is 1.9 cm wide and 2.3 cm long. When folded, the scale is 5 mm thick. Ebony was probably chosen because it is uniform in density, does not change its size or weight from moisture absorbed from the air around it, can be more precisely carved, and is smooth and durable.

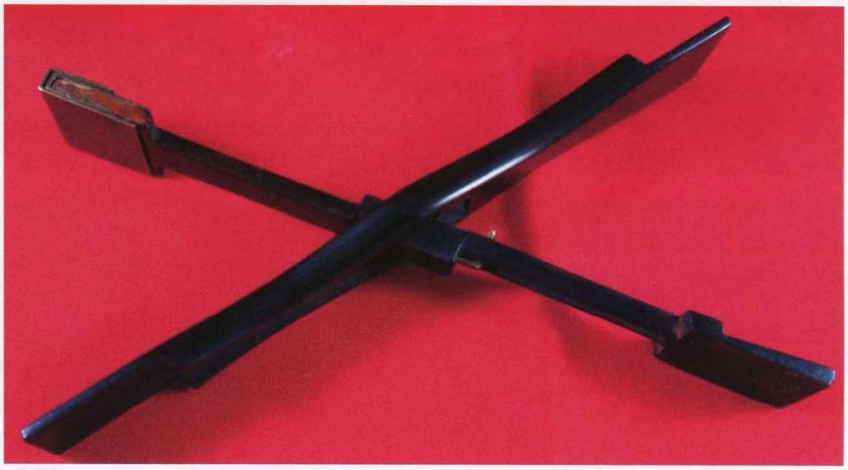


Figure 12. ▲▲ Cruciform Rocker by C. Hasenbein from Muhlhausen, Germany.

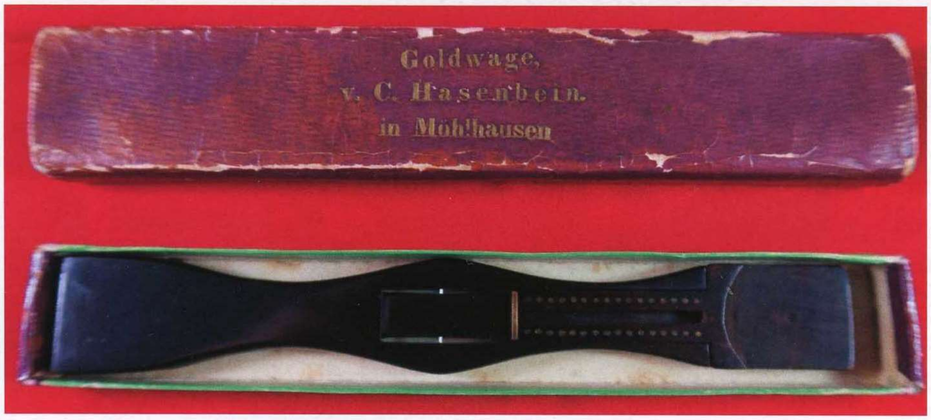


Figure 13. ▲▲ Hasenbein cruciform rocker with its box.

The rocker came in a cardboard box with a slip-on cover. The outer part of the box is lined in green paper. The cover is lined with brown paper and has written in gold lettering: *Goldwage v C. Hasenbein in Muhlhausen.* (Figure 13) Steve Beare suggested that based on the construction of the box, the scale dates from around 1850.

At first this was a mystery scale. As with other cruciform rockers it was likely used to check the weight of coins, but which ones and how was it used? In the beam there is a brass rod slider that runs half the length of the beam. (Figure 14) There are sixteen brass graduation dots inlaid in the beam on each side of the slider channel. (Figure 15) How the slider was used and what the graduation marks represent were part of the mystery.

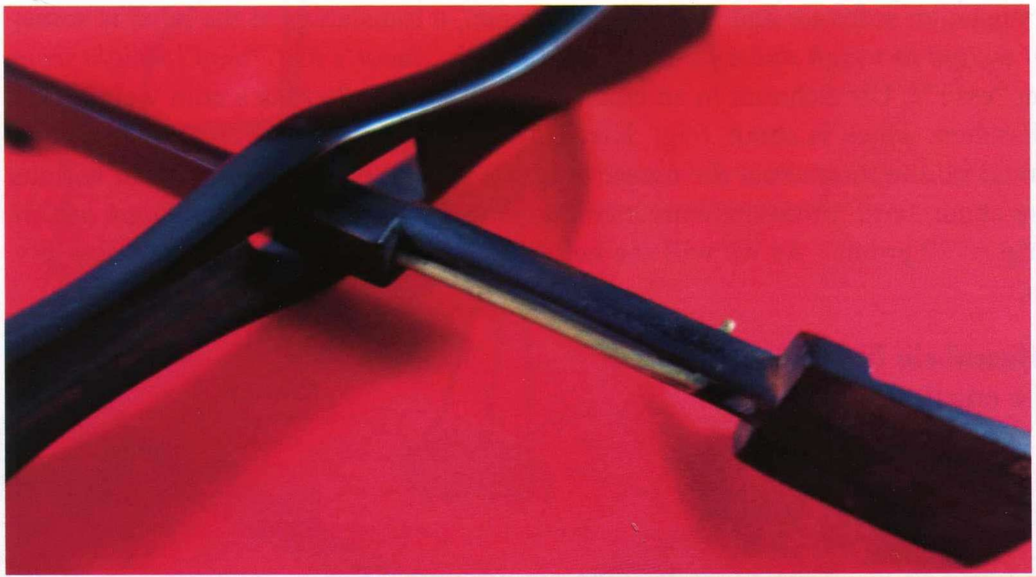


Figure 14. ≺≺ Hasenbein rocker‘s brass slider under the load side of the beam.

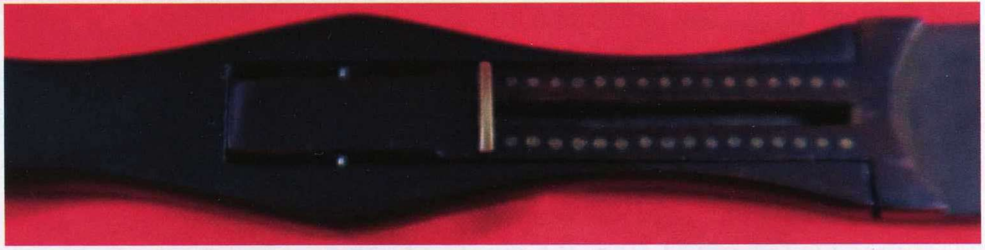


Figure 15. ≻≻ Hasenbein balance’s 16 graduation marks on the load side of the beam.

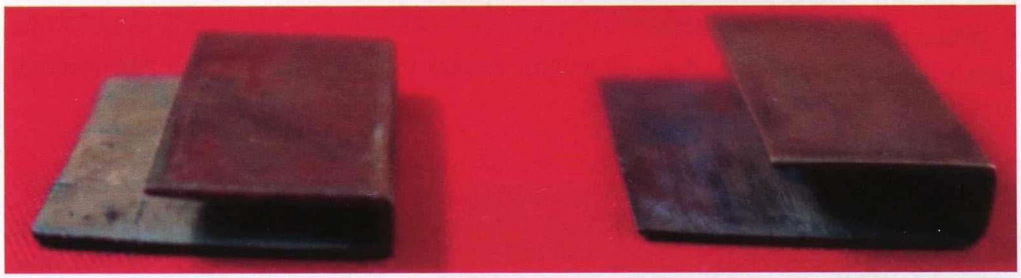


Figure 16. ≺≺ Hasenbein scale overlapping poises removed from the beam.

After a couple of “ah ha” moments, the mystery began to be solved. The first “ah ha” moment was discovering that the brass poises, although tightly fitted to the scale beam and to each other, in fact could be removed. (Figure 16) The cruciform rocker was used to check the weight of two coins, a lighter one using only the innermost poise and a heavier one with both poises slipped over the end of the beam. (Figure 17) The inner poise is 3.16 g; the outer poise is 3.27 g; combined they weigh 6.44 g.

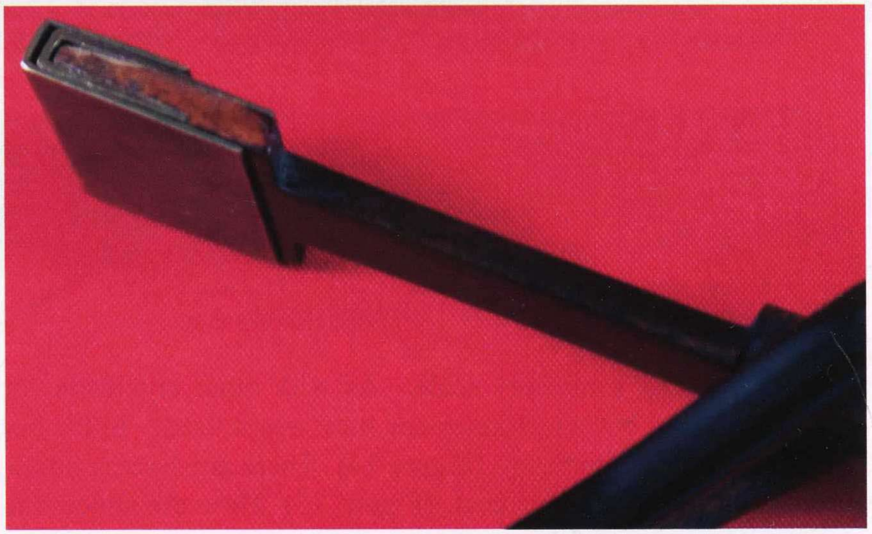


Figure 17. ⋀⋀ Hasenbein scale with two overlapping poises in place on the beam.

To use the rocker, one beam is held between two fingers and rests on a flat surface to keep it vertical. The other beam is used to check the weight of the coin. The inner or both of the brass poises serve as the poise when wrapped around one end of the beam. The coin is placed on the platter at the other end. If, when the coin is placed on the beam, the beam tips on the load side, then the coin is of correct weight. If the beam does not tip, then the slider in the beam is adjusted until the beam does tip and this determines how much lighter this coin is than a full-weight coin .

The slider is used to adjust the weight on each side of the fulcrum. There are sixteen positions for the slider marked with brass dots inlaid in the beam. If the slider is pushed to the fulcrum, position 0, it adds weight to the poise side of the beam and represents, with the brass poise(s), the correct weight of the coin. As it is pushed toward the load side, it adds weight to the load side of the beam and indicates, when the beam balances, how much the coin's weight is below the minted weight standard.

Two questions remained: What coins did it check? How is the slider graduated to determine how much less than true weight the coins were? Based on the maker or seller's name and location on the box, the initial hypothesis was that it was used to weigh the 10 and 20 gold mark; German coins that were minted in the 1870s. However, testing the scale with metric weights proved that these two coins were too heavy to use this scale to check their weight.

The second "ah ha" moment came from a web search and discovering that there was a scale just like it in the Streeter Collection. (Figure 18 is from the Streeter Collection[iv] web site and is provided courtesy of Medical Historical Library, Harvey Cushing/John Hay Whitney Medical Library, Yale University.)

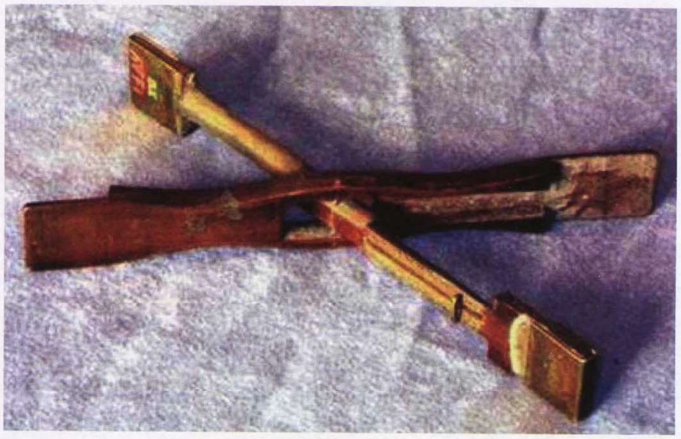


Figure 18a. ⋀⋀ French cruciform rocker. Courtesy of Medical Historical Library, Harvey Cushing/John Hay Whitney Medical Library, Yale University.

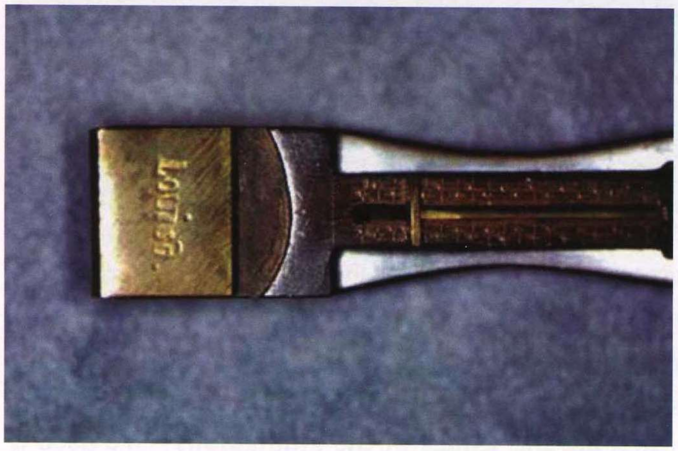


Figure 18b. << French or Moroccan cruciform rocker, 19th century. Made of rosewood and brass, the rectangular arms with spatulate ends open out from the center into two crossed balance plates adjusted at one end by a sliding scale. When closed, the scale measures 14.4 cm long x 2.1 cm wide x 7 mm thick. One end is marked "LOUIS D" and the other end is marked "DUC".

For that scale each weight is marked with the coin that it checks. The inner weight, marked Duc, checked the weight of the gold ducat and the outer weight is marked Louis D. The two weights together on the end of the beam checked the Louis D'Or French gold coin. Was it possible that the Hasenbein scale checked the same two weights?

To experiment, I attached a small vice to an old bread board and gently clamped the vertical part of the scale to the vice, just enough pressure to keep the scale vertical. This allowed me to place weights on the load end of the beam. With the help of coin weights in a Dutch coin scale box, (Figure 19) I discovered that with one of the weights on the end of the beam and the slider at the fulcrum position, the beam balances with a Dutch ducat coin weight on the pan. (Figure 20) With both of these weights on the beam and the slider at the fulcrum position, it balances with a double Dutch ducat coin weight on the pan. (Figure 21 shows beam balancing with two single ducat weights.)

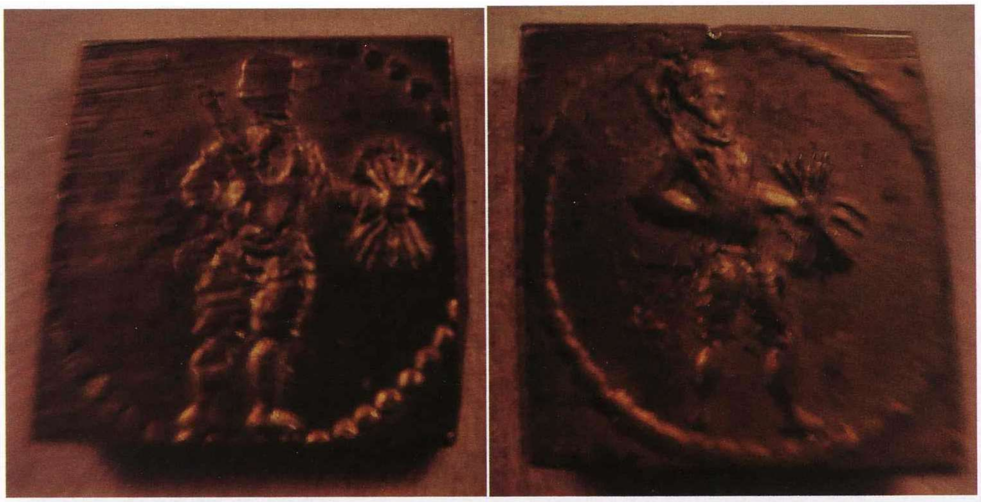


Figure 19. ≺≺ Examples of Dutch ducat coin weights.

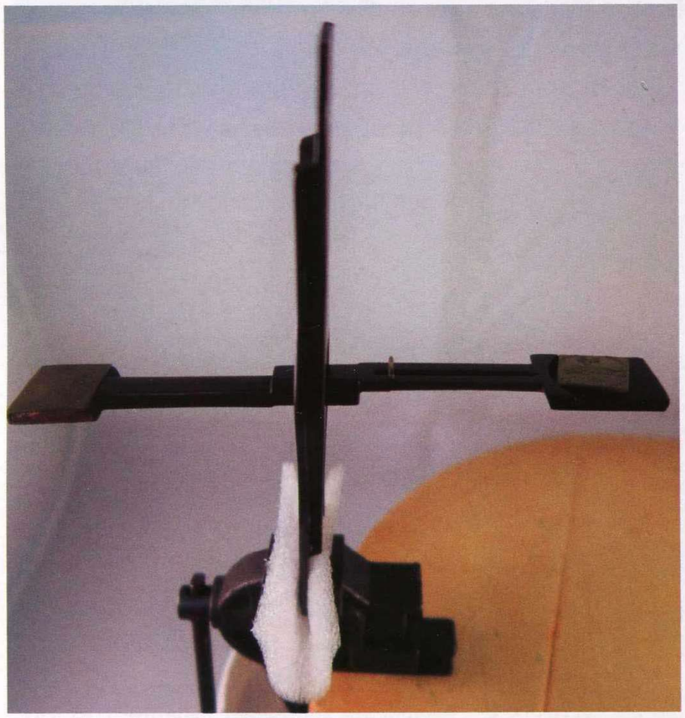


Figure 20. ⩓⩓ Hasenbein scale balancing with single poise and ducat coin weight.

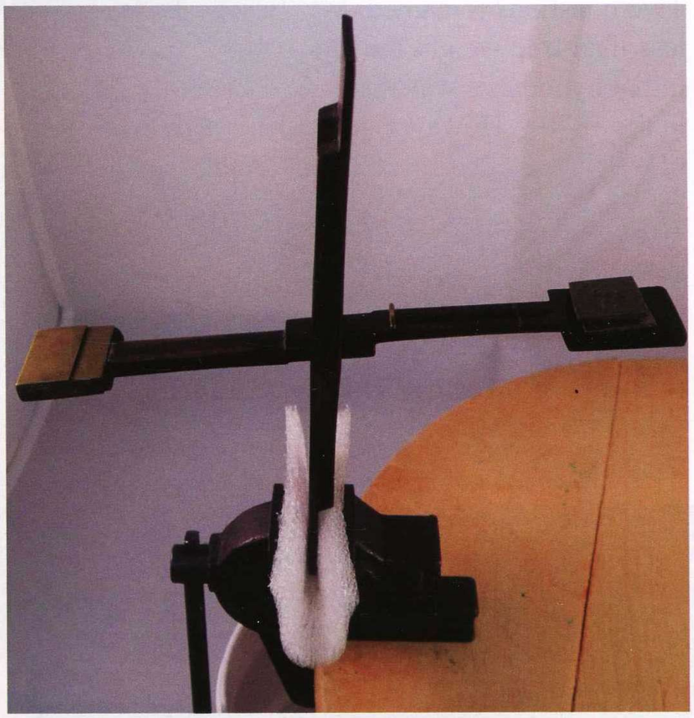


Figure 21. ⩓⩓ Hasenbein scale balancing with both poises and two ducat weights on the load end of the beam.

The next experiment was to determine the graduations for sixteen positions of the slider and thus how much the coin is below correct weight. In effect, the slider adds weight to the load side of the beam and thus compensates for the lost weight of the coin. But what are the values of the graduations? We used a set of gram and milligram weights to determine how much weight the slider added to the load side at some of the sixteen positions. (Table 1)

Table 1: EXPERIMENTING TO DETERMINE THE SLIDER GRADUATIONS

POISE	SLIDER POSITION	LOAD to BALANCE BEAM
No added weight	At Fulcrum	.4 g
No added weight	At Position 1	.35 g
No added weight	At Position 2	.3 g
No added weight	At Position 8 (Figure 22)	Balances the Beam
No added weight	At Position 9-16	Tilts on the Load Side

Each of the positions on the slider represents shifting .05 g from one side of the beam to the other. This suggests that the graduations could have been in Esschen.

This data suggests that when the scale was used to check the ducat (54 grains), if the beam balanced with the slider at the fulcrum, the coin was of correct weight. The combination of the slip-on poises and the full weight of the slider equal the minted weight of the ducat or double ducat. If the beam balances at a graduation between 1 and 8, the slider added at each position another Esschen to the load side of the beam, and thus determined that the coin was light by the corresponding number of Esschen. If the beam balanced with the slider beyond position 8, the coin was too light to be acceptable. If the beam balanced with the slider at position 8, the coin was light by .4 g or 8 Esschen, or about 6 grains, i.e. the least acceptable weight of the ducat was 48 grains. When the scale was used to check the double ducat (108 grains), if the scale did not balance with the slider at position 16, the coin was too light to be acceptable. If it balanced with the slider at position 16, the coin was light by .8 g or 16 Esschen, or about 12 grains, i.e. the least acceptable weight was 96 grains.

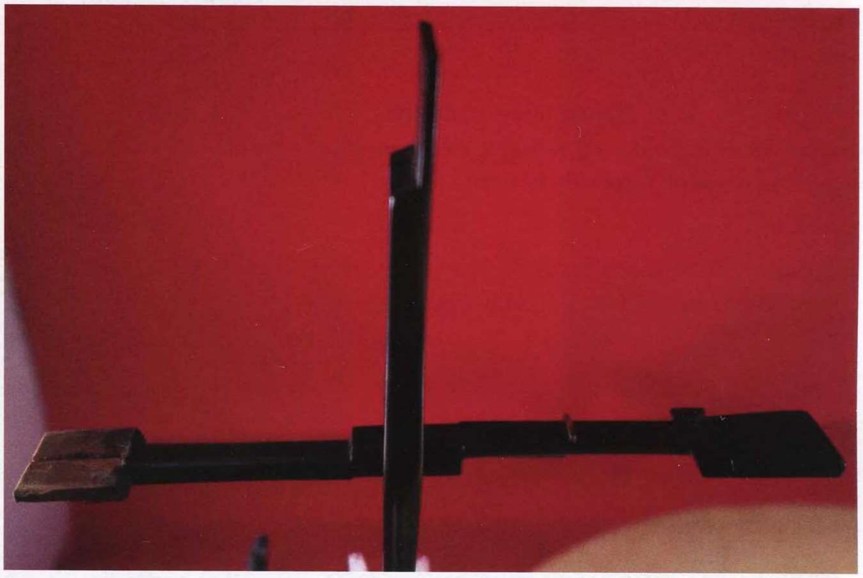


Figure 22. ▲▲ Hasenbein scale balancing with no poise or load with slider at position 8.

The design of the beams of the one in the Streeter collection is the same as my Hasenbein scale; the shape of the two brass poises is the same. Although the picture shows one weight on each end of the beam, in use, depending upon the coin to be checked, one weight (for the Ducat) or both weights (for the Louis D'Or) slid over the far end of the beam in the picture and the coin was placed on the end of the beam with the curved rest and the slider (Figure 18a).

The slider appears to be identical in design. It appears from the picture in Figure 18b that it too has brass inlaid marks for the positions of the slider. It looks like there are about 20 positions and that possibly the graduations are slightly different on each side of the slider. If that is the case, then presumably, the graduations on one side were used to check how short of official weight the Louis D'Or was; and the graduations on the other side applied to the Ducat.

A similar scale is in the collection of the Mainfrankischen Museums Wurzburg in Germany. Their catalog describes how the scale was used, but not which coins it checked. It provides dimensions of their scale and says that it came from southern Germany and dates from about 1850.

Steelyard with fold-down pointer and coin slot

The third example is an all brass steelyard. The scale came in an oval paperboard tubular box with a cap end. The box is covered with marbled paper, which suggests that it was made after 1853[v]. (Figure 23) The steelyard has a slot (23mm x 2mm) with sides to hold the coin vertically on the load side of the beam. The other end of the beam has a small fixed poise and a sheet brass moveable poise. (Figure 24) The beam is 12.5 cm long. There are seven graduation lines on the beam without marked values for each one. (Figure 25) The pointer, which folds down when the scale is closed, is 6.3 cm long.

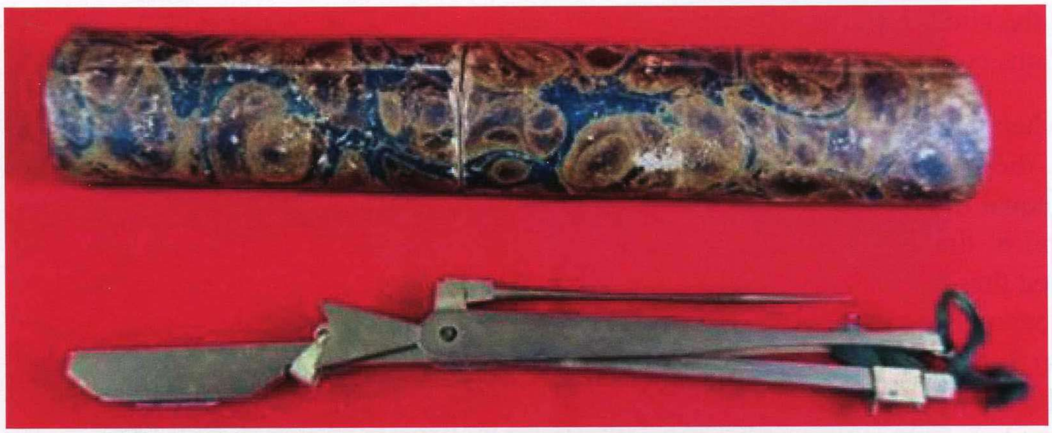


Figure 23. ≺≺ Slotted ducat scale and case.

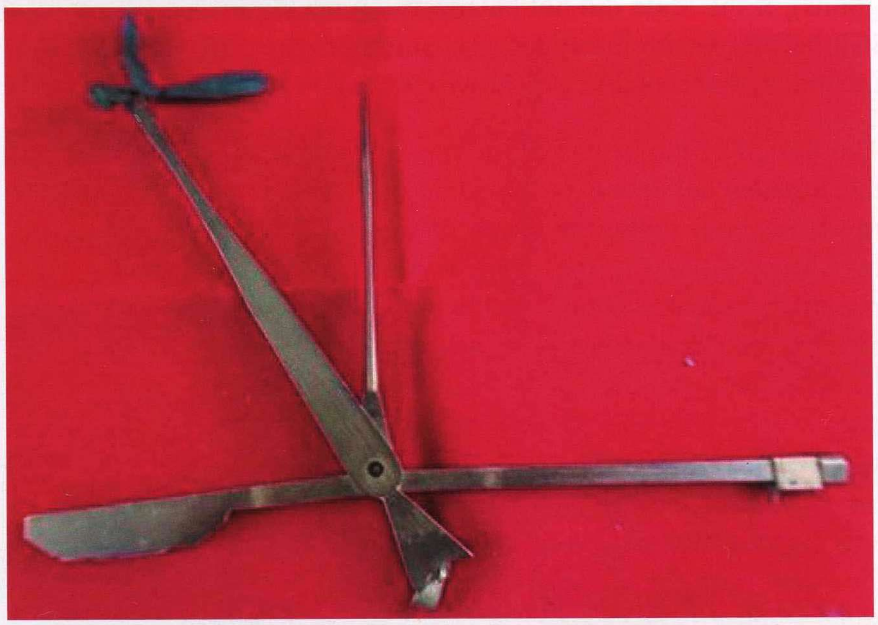


Figure 24. ≻≻ Slotted ducat scale fully opened; coin holder on left side of beam; sliding poise on right side of beam.

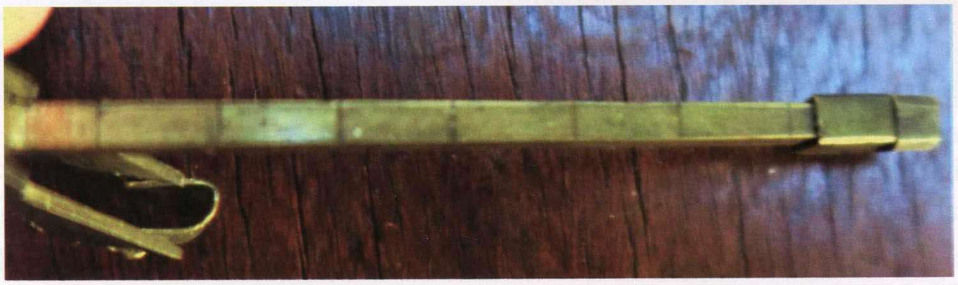
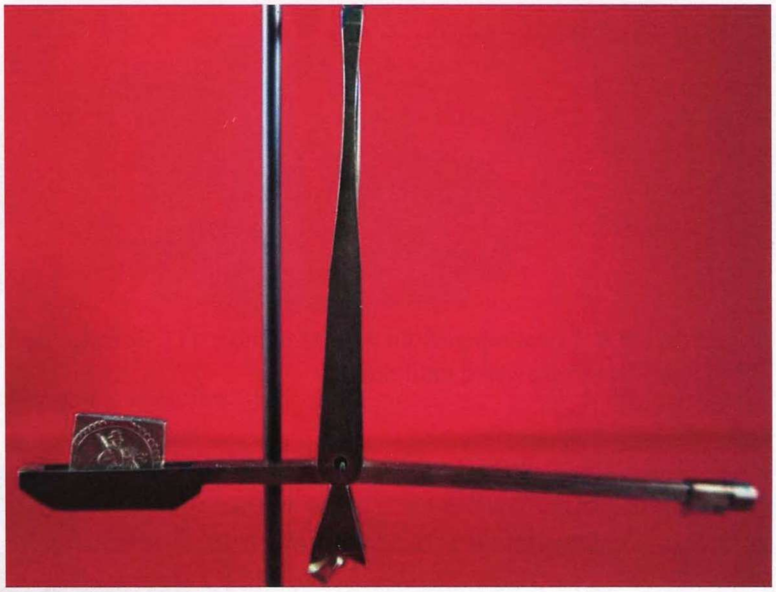


Figure 25. ≺≺ Seven graduation marks on slotted coin scale.

The coin to be tested is placed in the slot. A correct weight ducat (54 grains) will balance with the poise at the far end of the beam. (Figure 26) If the coin is less than the true weight, the beam should balance with the poise at one of seven positions on the beam. In effect, by sliding the poise **toward** the fulcrum, the amount of weight to balance the scale is reduced, thus indicating how much a coin's weight is below its minted weight.

Unfortunately, other than the seven lines on the beam, the scale is not marked with the graduations. By experimenting with various grain weights I determined that 2 dwt (48 grains) balances the scale with the poise at the third graduation in from the end. (Figure 27) With 40 grains the scale balances with the poise at the inner most graduation (closest one to the fulcrum). (Figure 28) Thus each graduation indicates a loss of 2 grains of weight. The scale is designed to check the weight of the coin between 40 and 54 grains.

Figure 26. ➢➢ Slotted scale balances with a Dutch ducat coin weight and the poise at the end of the beam.



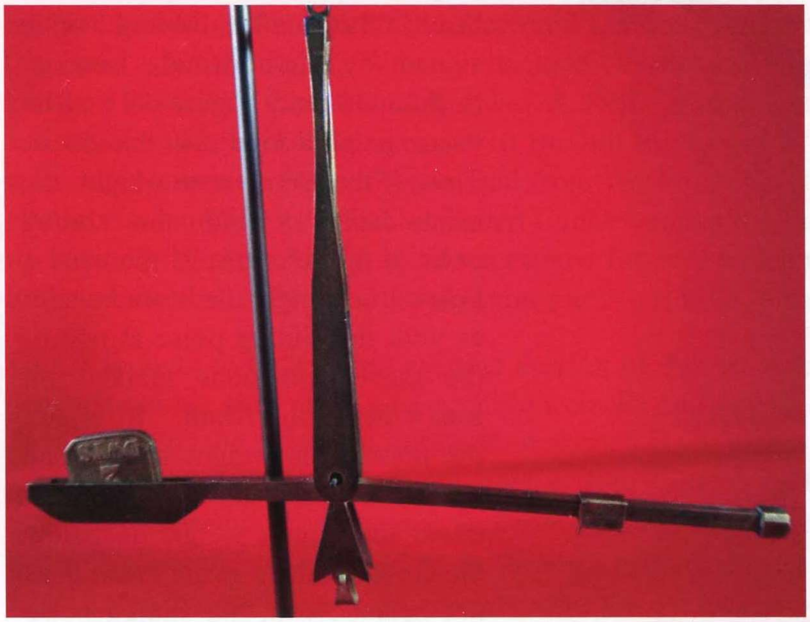


Figure 27. ≺≺ Slotted ducat scale balances with 2 dwt (48 grains) and poise at the central position.

If the least acceptable weight of the ducat is 48 grains, why would the scale provide the weight of the coin between 40 and 48 grains? Perhaps it was intended to check the weight of a lighter coin of the same diameter (it fits in the slot) as the ducat. Another explanation could be if the ducat is between 40 and 48 grains, its weight determined how much in fractional ducats someone would get for turning in an underweight ducat, i.e. what is the value of the gold itself.

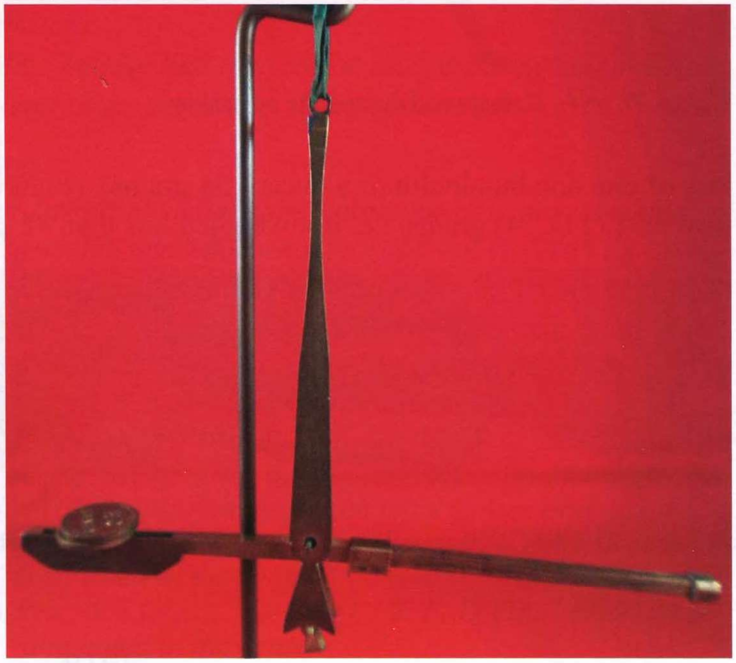


Figure 28. ➢➢ Slotted ducat scale with 40 grains and poise close to fulcrum.

Catherwood Ducat Scale

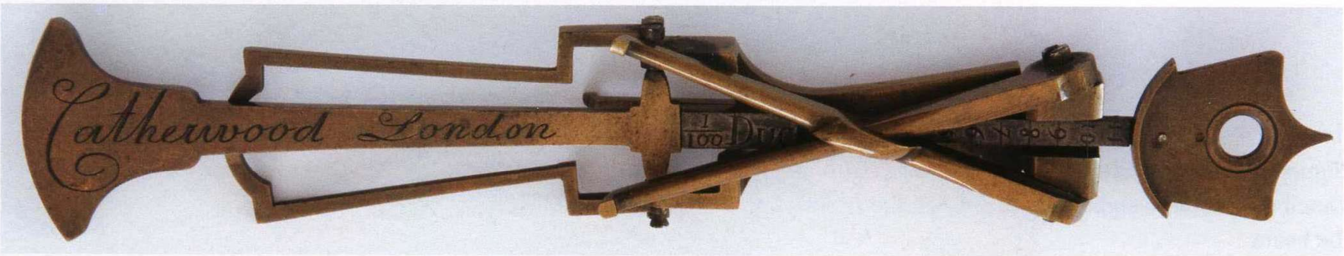


Figure 29. ▲▲ Illustration from N & Q number 111 from Guido Zavattoni appeared on page 1341 of EQM Issue 2 of 1990, but was not answered until now.

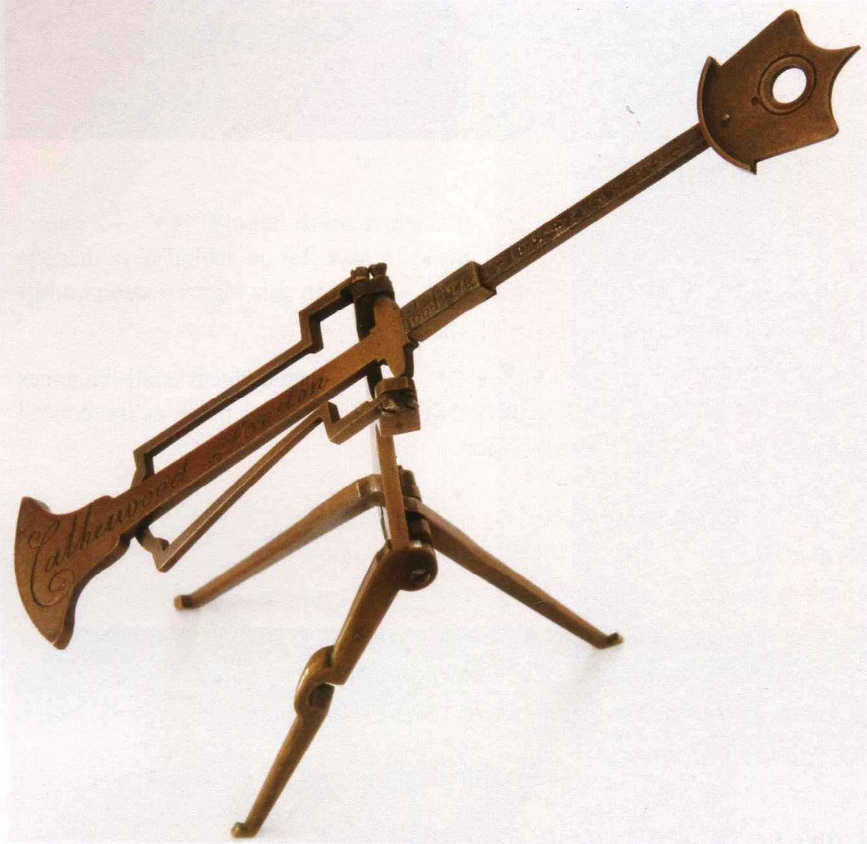


Figure 30. ▲▲ Catherwood ducat scale opened up.

The fourth example can be found in a query from Guido Zavattoni in EQM 1990 Issue 2 page 1341. (Figure 29) It is a very elaborate, beautifully made folding scale signed by Catherwood, London. (Figure 30 and Figure 31) The beam is preloaded for the ducat. Thus, if the coin is true weight, the beam balances with the sliding poise at the fulcrum. If the coin is below true weight the beam balances with the sliding poise at one of the eleven positions marked on load side of the beam. In effect, the poise adds weight to the load side of the beam and indicates how much the coin's weight is below the correct value. If the beam does not balance with the sliding poise at the position furthest from the fulcrum, then the coin is less than the lowest acceptable weight. Since each graduation represents a loss of one one-hundredth of a ducat (.54 grains), (Figure 32) the coin was not acceptable if it lost more than 5.94 (11x.54) grains, i.e. if it weighed less than 48 grains.

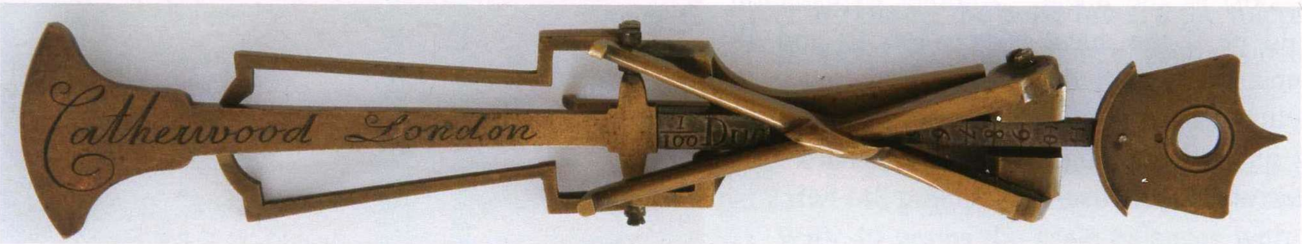


Figure 31. ▲▲ Catherwood ducat scale folded up. Note: graduations marked as one one-hundredth of a ducat (.54 grains)[2].

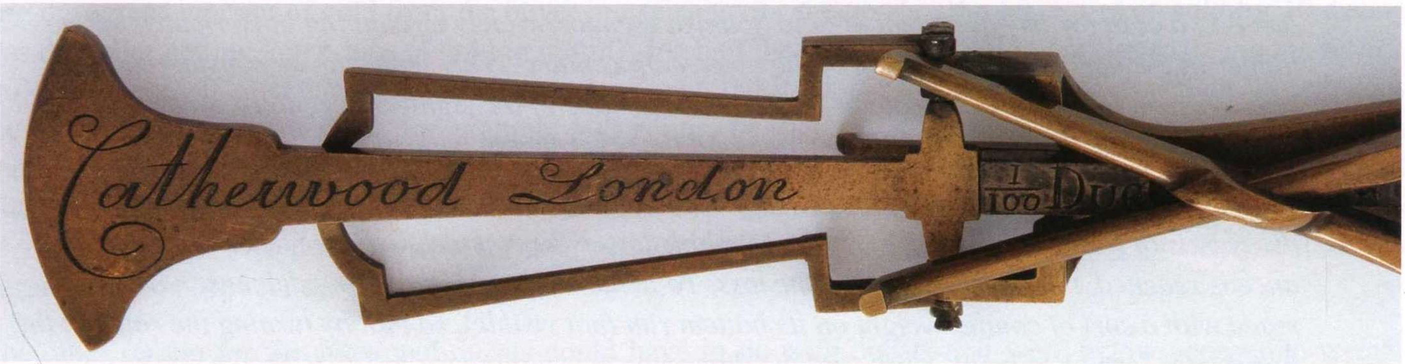


Figure 32. ⩓⩓ Catherwood ducat scale maker's signature and graduations.

The query asked for additional information about the scale and its maker. There was no response at that time. Now, almost thirty years later, the web provides information to begin to answer the questions. A web search for Catherwood produced a link to pictures and information about a watch and a clock in the British Museum's collection[vi]. They were made by Joseph Catherwood around 1800. The styles of the engraved name on the watch (J Catherwood London) and on the clock dial (Jos^{ph} Catherwood London) are the same as on the scale. We can conclude that the scale was made by Joseph Catherwood. From F.J. Britten's book *Old Clocks and Watches & Their Makers,* we learn that Joseph Catherwood was a clock and watch maker and in business at 10 Bunhill Row from 1775 to 1825. Joseph & William Catherwood were at 2 Newcastle Place, Clerkenwell from 1804 to 1842. It also lists G&R Catherwood at 35 Kirby St. Hatton Garden 1809 to 1830 and Robert Catherwood at the same address in 1835. It was obviously a family business. Unfortunately, we do not know for sure which Catherwood made the scale since there is no initial on the scale. Because the signatures are so similar, it seems likely that it was Joseph.

This is thought to be the only existing version of this scale, and we speculate that Catherwood made it to demonstrate his skill at making precision clocks and watches, rather than to use it. In an email, Guido Zavattoni adds the following information about a clock maker also making such a precision scale:

> *"It makes sense since many scale-makers were also watch-makers and makers of fine mechanical instruments. For instance Jecker made telescopes and other instruments.*
> *I share the view that he made the scale to demonstrate his skills: would that have happened in Europe it could have been a masterpiece for the admission to a guild. Years later it could have been made to promote his production at an exhibition.*
> *As for the making a scale for his own needs, I believe that the scale is too purposely complicated for such a job, especially since he could simply buy, or make, a ducat coin weight."*

Ducat Scale with Graduations on a weighted dial

The fifth example is pictured and described in *The Zavattoni Collection- Catalogue of coin scales and coin weights from a private collection- Part IV Münzgewichte und Münzwaagen USA, ARAB STATES, AUSTRIA, DENMARK, GERMANY, INDIA, LOW COUNTRIES, MOLDAVIA, POLAND, RUSSIA, SWITZERLAND, TURKEY, UNITED KINGDOM* by Guido Zavattoni. He provided the following text from the book and accompanying picture to use:

> *MAKER: unknown*
> *SIZE: mm 121 x 41 x 9 (closed); mm 176 x 41 x 121 (open)*
> *SCALES: folding scale in brass and steel, screws and pointer in blued steel; the pan for the coins is hinged on two screws and overturns if the coin is not exactly placed in its center (this ensures the most correct weighing); at the other end of the beam is an adjustable roundel marked 1, 2, 3, 4, 5, 6 e 7; a pointer with incuse "1. DUC:" is screwed to the beam*
> *WEIGHTS: three round brass weights marked "1. LOUIS." (3, 27 g), "2. L. D'OR." (9, 92 g) e "20. FR." (3, 00 g), bearing in incuse "2" and holed in the center*

NOTES: this scale is probably of German origin, as shown by the presence of weights for the Louis aux 8 L, a coin (or its equivalent of gold Spanish escudos) widely circulating in Germany, but no longer in France, at the beginning of the nineteenth century[1]*. This scale can be considered as an improvement to the Dukatenwaagen of Nuremberg made in the eighteenth century, since it is based on the differential weight between one pan and the other, being equivalent to one gold ducat.*

To weigh a ducat, the coin must be put exactly in the center of the pan and if the pointer is on zero the coin is of full weight (3, 47 g); if the weight is lower the roundel must be turned until the balance is reached, the pointer marking the loss. To achieve this result the roundel must have been made with a sort of counterweight on its bottom rim (not visible), so that by turning the roundel the barycenter [center of mass] *shifts and the difference in weighing (in As*[vii]*?) is shown on the upper rim.*

The additional weights have a mass that, added to that of a ducat, gives the full weight of the relevant coin; they must be inserted in the appropriate pin in the roundel and the same above procedure applies.

The scale can be folded in the form of a lens, in order to protect the roundel and the pointer.

This is probably a unique piece.

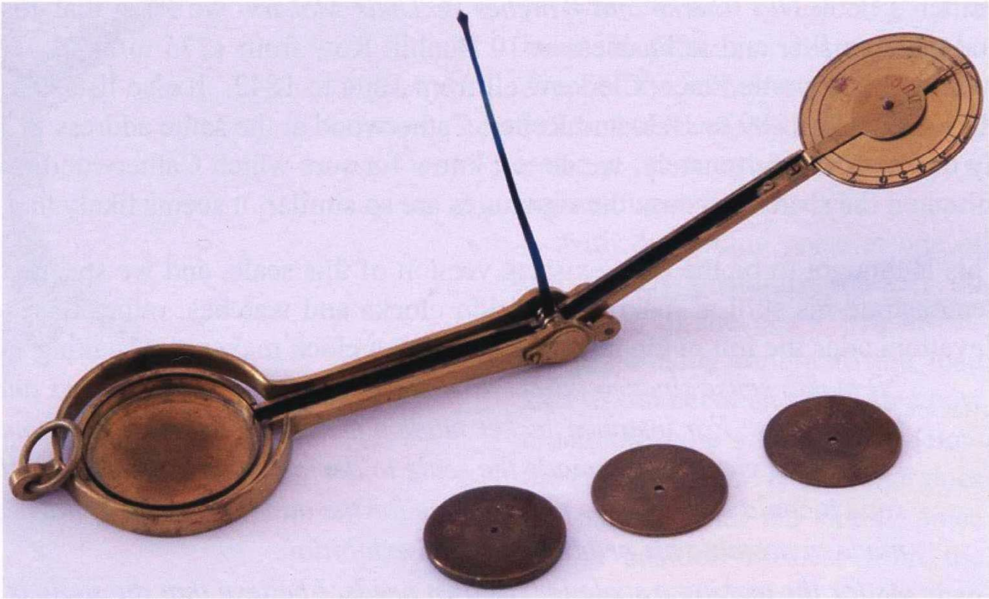


Figure 33. ➢➢ Scale for checking the ducat and three other gold coins. (Courtesy of Guido Zavattoni)

Why were fractional ducats minted?

As noted earlier, most of the European governments minted single and double ducat coins. Some others minted larger ducat coins. They also minted fractional ducats – ½, ¼, 1/8, 1/16 and 1/32.[viii] Why mint the fractional coins which would have been small and very light? There are three possible reasons, two of which could be because of lost weight for the ducats.

First, the fractional coins could be used in the normal process of buying goods with the coins. In that case, the negotiation between buyer and seller of the price in ducats for a commodity could have resulted in the buyer agreeing to pay, for example 11½ or 11¼ ducats for, say, a load of wheat. The use of fractional ducat coins would allow this negotiation to take place.

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1. *The circulation of the older Louis gold coins was forbidden by the decree of the 30th of October 1785, providing for the coinage of the Louis Neuf.*

Because the ducat was used to pay gold for goods, the seller of the goods wanted to be sure that they were getting the agreed amount of gold from the buyer in exchange for the goods. If a load of grain sold for 10 ducats, was the seller getting 540 grains of gold in return? Each of the ten ducats would be weighed, using the seller's scale of course. If each ducat was of acceptable weight, but if adding together the actual weight of each coin, the total weight of the ten was for example 500 grains, i.e. light by 40 grains, there might be a negotiation about how many fractional ducats the buyer needed to add to the ten ducats to compensate for the lost weight. The one thirty-second ducat (1.4 grains) might have been used to compensate for small amounts of lost value of a single ducat. (We don't know how much a ducat could buy, and hence how many situations one or two ducats could be used for the purchase.)

The other reason for the fractional ducats could have to do with ducats that were below acceptable weight. They are still gold, although not enough of it by weight to be acceptable. These coins were supposed to be cut in half and melted down, probably by the minter. Presumably the government body that minted the ducats would buy back these ducats to get them out of circulation. But how did they pay the holder of the underweight coin? The thought is that they weighed the coin and paid for it using fractional ducats based on the value of the amount of gold in the underweight coin. Again, the arithmetic could have resulted in the need for the very light 1/32 ducat coin.

Conclusion

These five scales, designed to check the weight of the gold ducat, except for the first type, they are very unusual, possibly the only ones. They demonstrate the skill and ingenuity of 18th and 19th century makers to create an instrument capable of determining small variations in the weight of the coin. By conducting experiments we confirmed that two of them, which were not marked to weigh the ducat, actually did so. These experiments also helped to determine what the graduations represent in terms of lost weight. This provides a better understanding of when a ducat was of acceptable weight and when it was not.

Acknowledgements

I am grateful to Guido Zavattoni for his invaluable assistance, for providing two such fine examples of these unique scales, and his generosity in giving permission to use the information from his book. I also thank Jaap Visser for finding the other three rare examples of ducat scales and for telling me that the Wurzburg Museum catalog had information about another version of the Hasenbein scale. To the other Society members who contributed ideas, pictures or information as noted, thank you. Without all of these contributions, this investigation could not have taken place successfully and the results shared.

Postscript

This investigation and its conclusions about the scales and their graduations are based on the hypothesis that like many of their contemporary coin scales, they were used to determine the lost value of a gold coin. However, other information[ix] suggests that various countries minted versions of the Dutch ducat which contained more copper or silver and less gold than the genuine ducat. Since the density of copper (8.96 g/cm^3) and silver (10.5 g/cm^3) is less than that of gold (19.3 g/cm^3), these coins if of the same size, would weigh less than the genuine ducat. Perhaps some of these scales were also designed to detect such counterfeits.

Notes:

i. https://en.wikipedia.org/wiki/Ducat#cite_note-Oxford-10
ii. See for example https://coinweek.com/world-coins/world-gold-coins-2/world-coins-history-netherlands-gold-ducat-began/ and https://coinweek.com/world-coins/world-coins-history-netherlands-gold-ducat-part-2-standard-followed/
iii. For some German coin scales the sheet weights were in Esschen equal to about 50 milligrams.
iv. The Streeter Collection website can be reached through https://isasc.org/.
v. From *The History and Techniques of Marbled Paper* Katie Behrens: "For approximately 400 years, the secrets of marbling paper were kept closely among the masters. Bookbinders were anxious to learn these secrets, since it was fashionable to use marbled paper as endpapers. Then, in 1853, a marbling master named Charles Woolnough published a book titled *The Art of Marbling*, which turned paper marbling into a popular handicraft and opened the floodgates for its use in everyday bookmaking." https://blog.bookstellyouwhy.com/the-history-and-techniques-of-marbled-paper
vi. See https://artsandculture.google.com/asset/longcase-regulator-by-thomas-earnshaw-joseph-catherwood/-gGVbZ05MLEiSA and https://www.britishmuseum.org/collection/object/H_1958-1201-813
vii. German weight unit Ass or Esschen equal to about 50 milligrams
viii. See for example https://coinweek.com/world-coins/world-gold-coins-2/world-coins-history-netherlands-gold-ducat-began/ and https://coinweek.com/world-coins/world-coins-history-netherlands-gold-ducat-part-2-standard-followed/.
ix. See for example https://coinweek.com/world-coins/world-gold-coins-2/world-coins-history-netherlands-gold-ducat-began/ and https://coinweek.com/world-coins/world-coins-history-netherlands-gold-ducat-part-2-standard-followed/

Hands Across the Sea

BY MIKE SHARPE

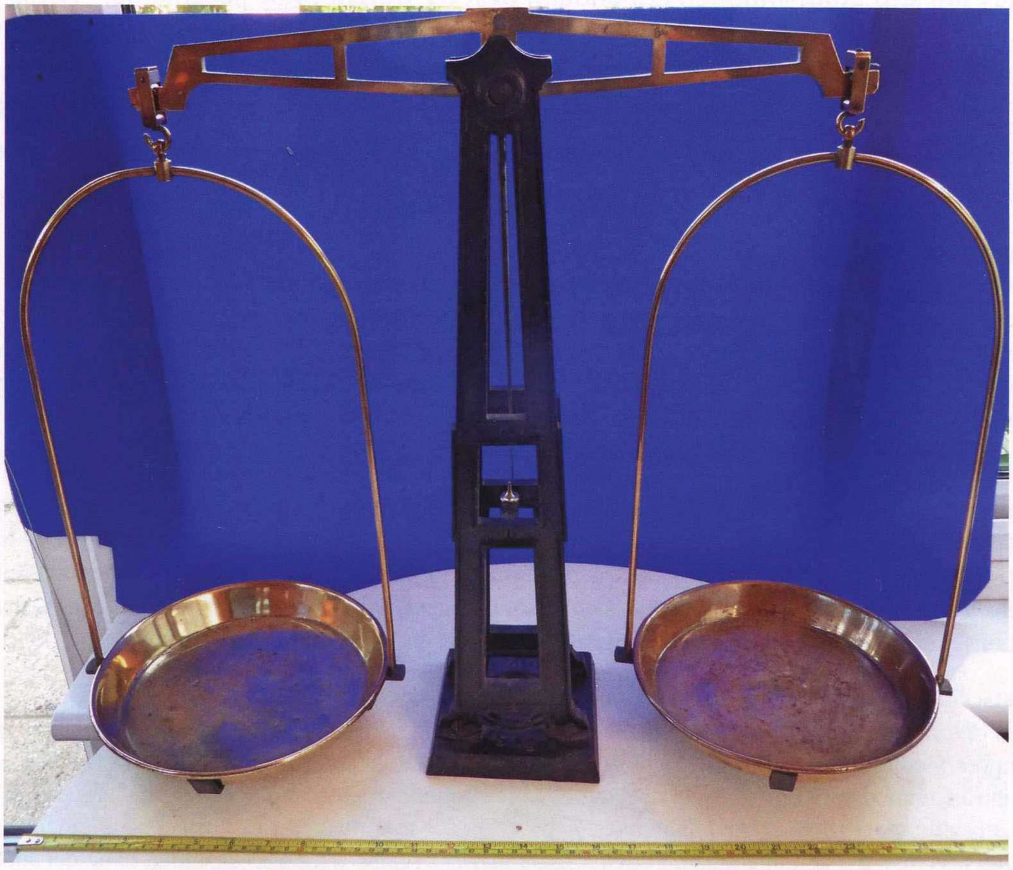
Back in 2017, I was emailing a fellow ISASC member about Troy Weights. He was in New Zealand, I'm in England.

Tony McCarthy (for it was he) had written a great article for EQM Issue 1 2017 *Grandad's Gold Scales.*

We were discussing the links between Great Britain and New Zealand, the use of the Troy ounce (oz tr) for precious metals such as gold and silver, and the clues that could be gotten from antique 19th-century equipment.

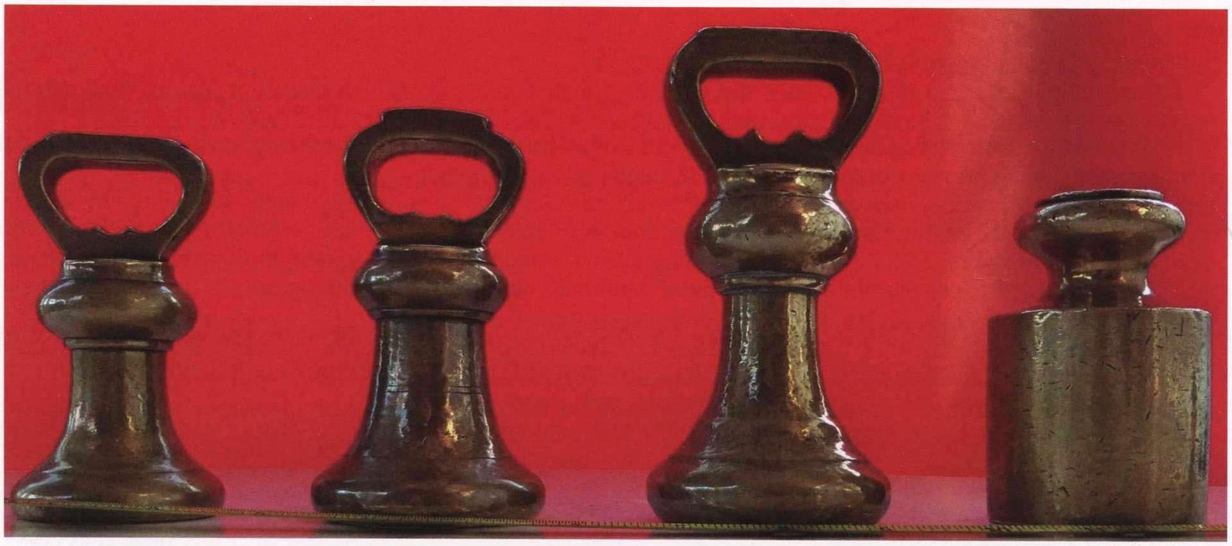
I happened to mention that I'd seen an interesting scale with weights offered on EBay UK, and from there we began a preservation project lasting a couple of months and spanning the globe.

First, the scale:



It wasn't a traditional English style, but obviously heavy-duty.

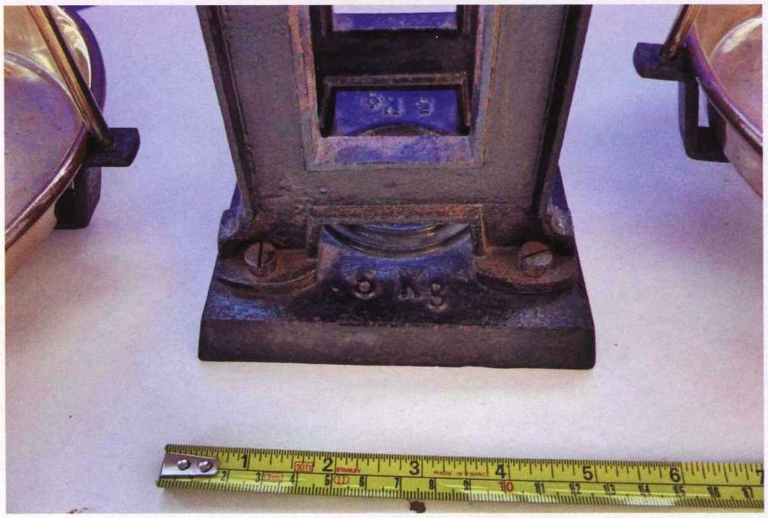
Then the weights:



Slightly unusual in style for Victorian bell-weights, and in values of 20 ounces Troy, 30, 40 50, 100, 200 and 300 oz tr. 300 oz tr corresponds to 20 lb 9 oz avoirdupois.

Tony was enthusiastic, but unable to buy on the EBay system for all sorts of reasons. So, I offered to handle the purchase and shipping. In the end two heavy (and delicate) consignments cost twice as much to transport as the seller had wanted for the purchase.

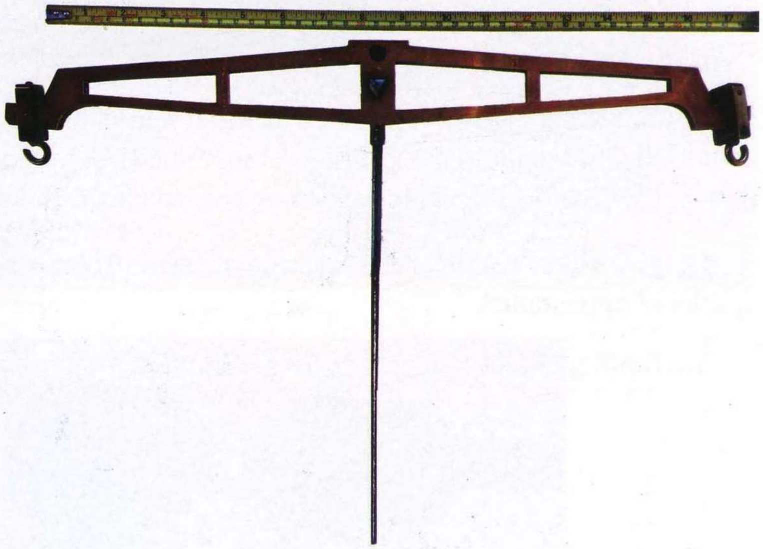
The scale was special because it was about 2 feet tall, 2 feet wide (60 centimetres by 60cm), and the beam had a capacity marked as '5 kg' stamped over '10 kg'. The abbreviation for kilograms indicated a European rather than an English origin. But why the over stamping?



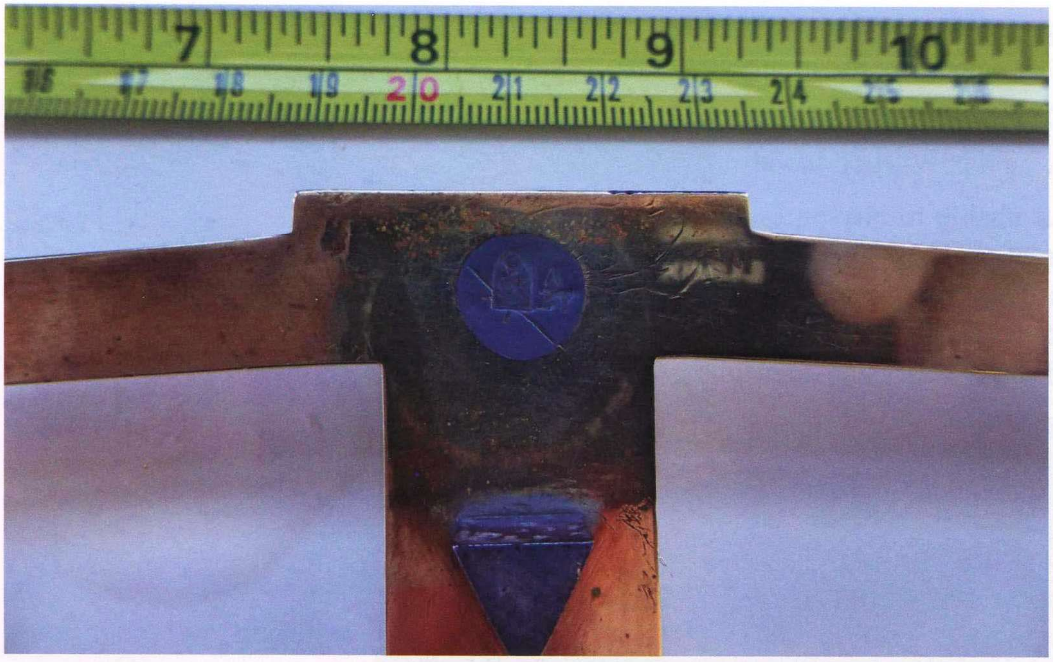
10 kg is about 320 troy ounces, 5 kg only 160 oz tr. The heaviest weight in the set was 300 oz tr, but the total of all the weights 740 oz tr. So there was a mystery…

The support for the beam had '5kg' cast into it. So, was this a 'marriage' scale, like English grandfather clocks have had the old mechanism put into a new case?

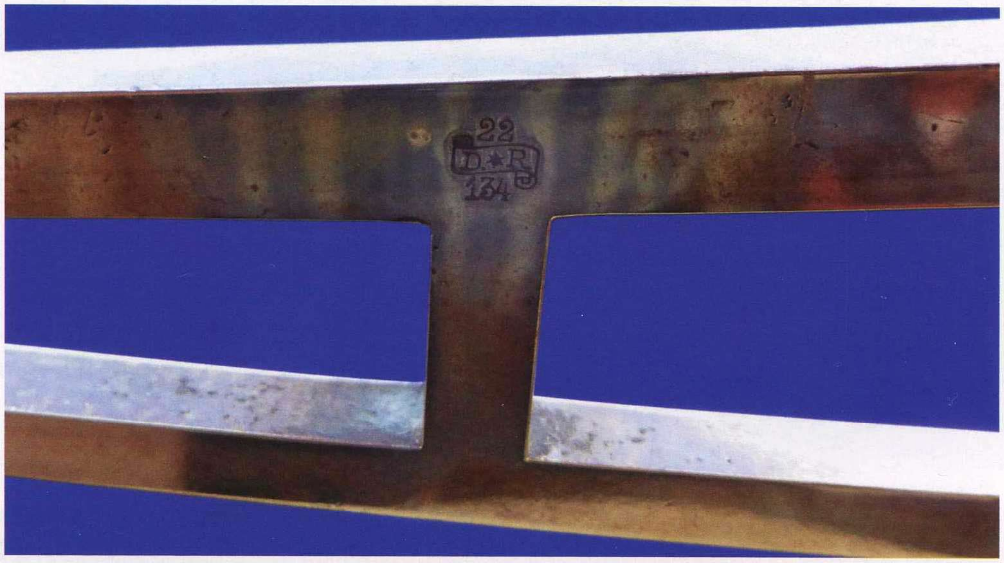
The 17-inch / 43 cm brass beam with steel screw-in pointer offered further clues:



The British Government stamp is on the lead plug which, unusually, sits above the central knife-edge (fulcrum). It is 'GR' over number '37' sitting within a shield, signifying Sheffield, a great metalworking city in Yorkshire, England. The date is 'A 27', signifying the first half of 1927, but this may be a repair and reverification date as the faint traces of a six-pointed star impression on the lead still remain.

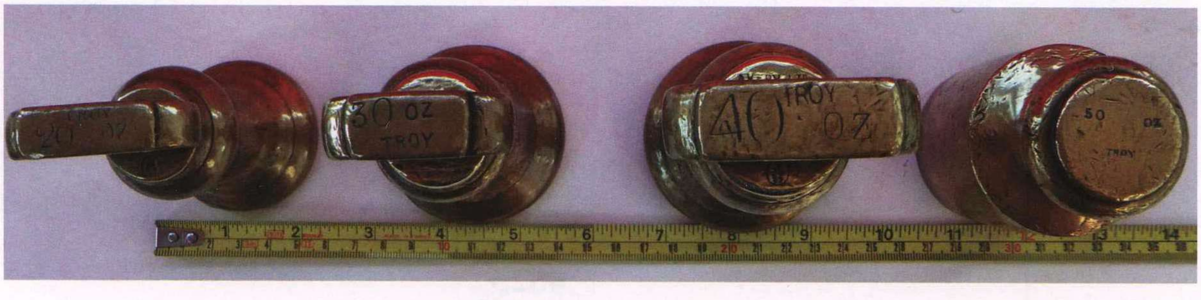


The real clue to the origins of the scale seems to lie in the German verification mark (‘*Eichzeichen’)* stamped into the brass of the beam itself:



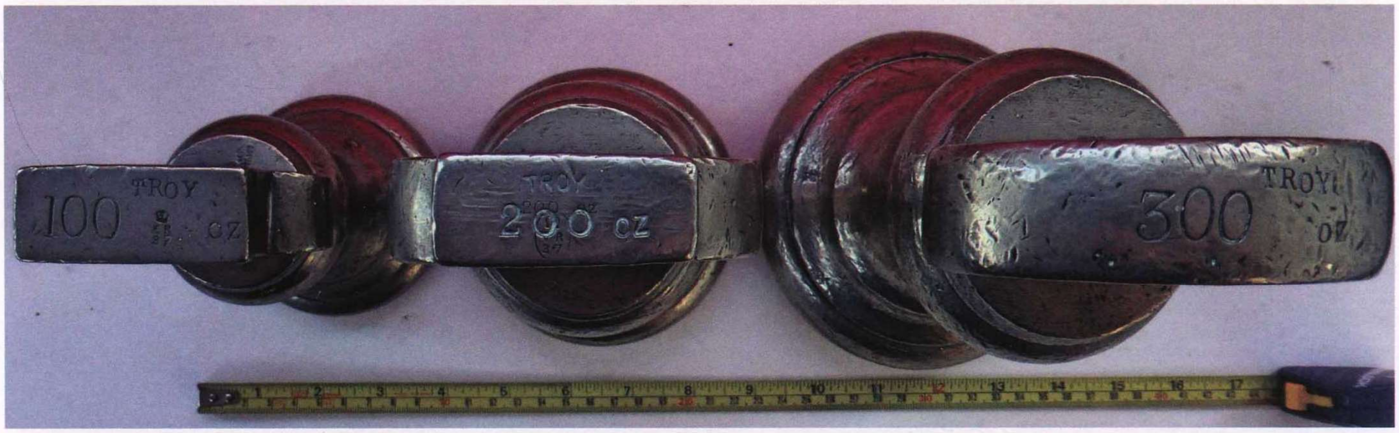
From the wonderful collection of European marks published as a CD-ROM by the German society ‘Mass und Gewicht’ (authored by Gregor Linkenheil), I judged this to be attributable to Stuttgart, Germany, 1910. More knowledgeable folks may care to check and correct me.

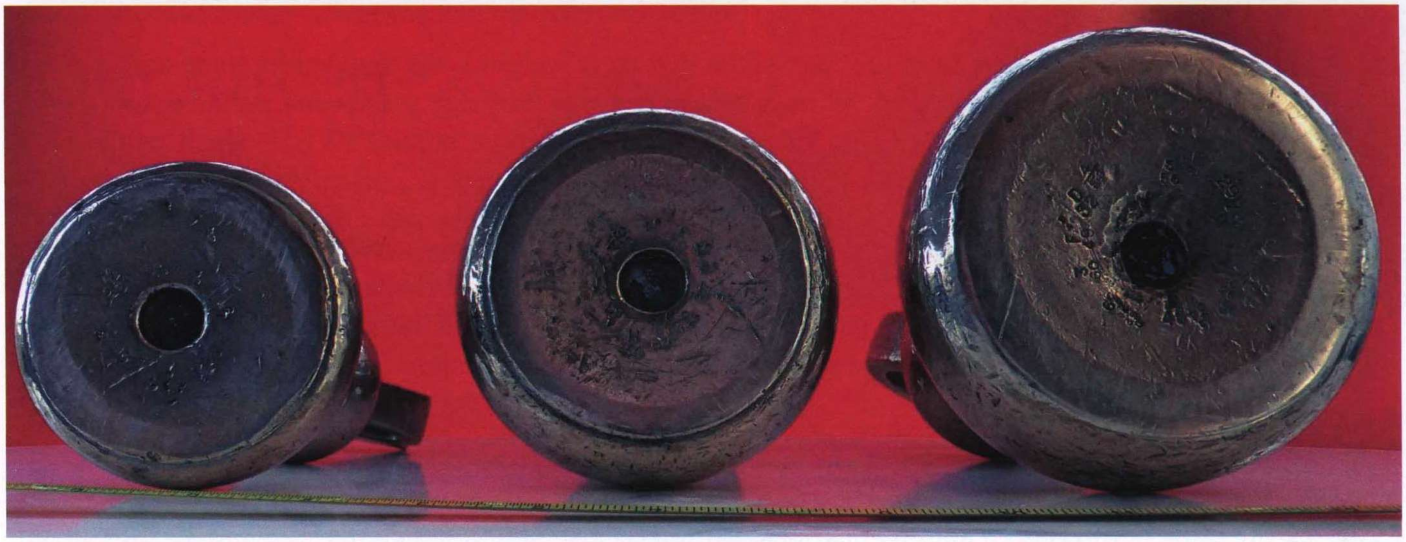
Turning to the weights, the Government stamps gave some more clues, but more important were the quirks of appearance:



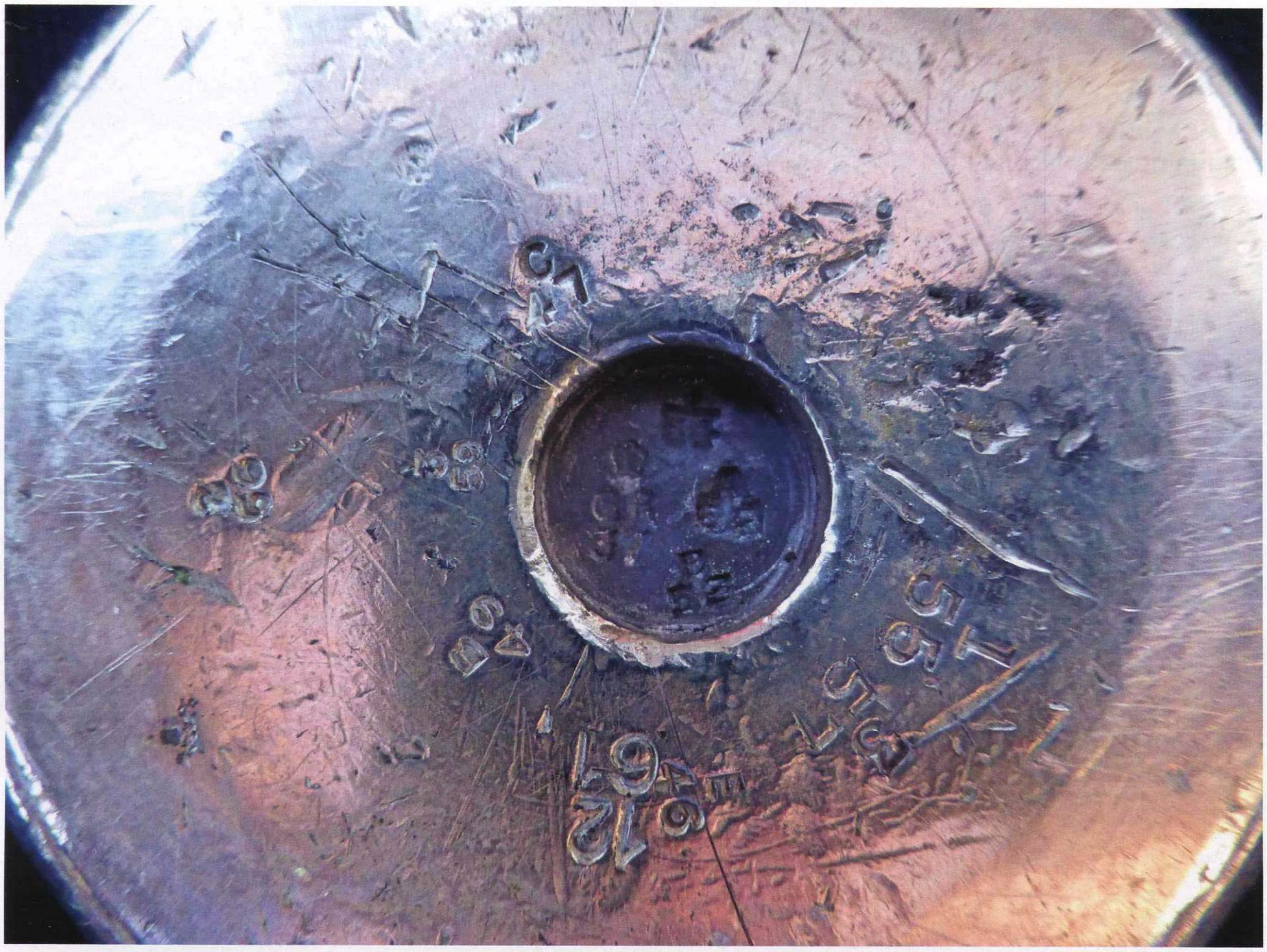
These are all Troy weights, but not from the same set.

The difference in colour between the largest three and the smaller four is quite striking – silver as opposed to yellow brass. I thought perhaps the 300 – 100 group had been silver-plated, but there was no indication of wear or flaking.





Some of the Government stamps on the weights are VR (Queen Victoria) 37, again indicating Sheffield, and the dates form a sequence from the 1920s to the 1960s.



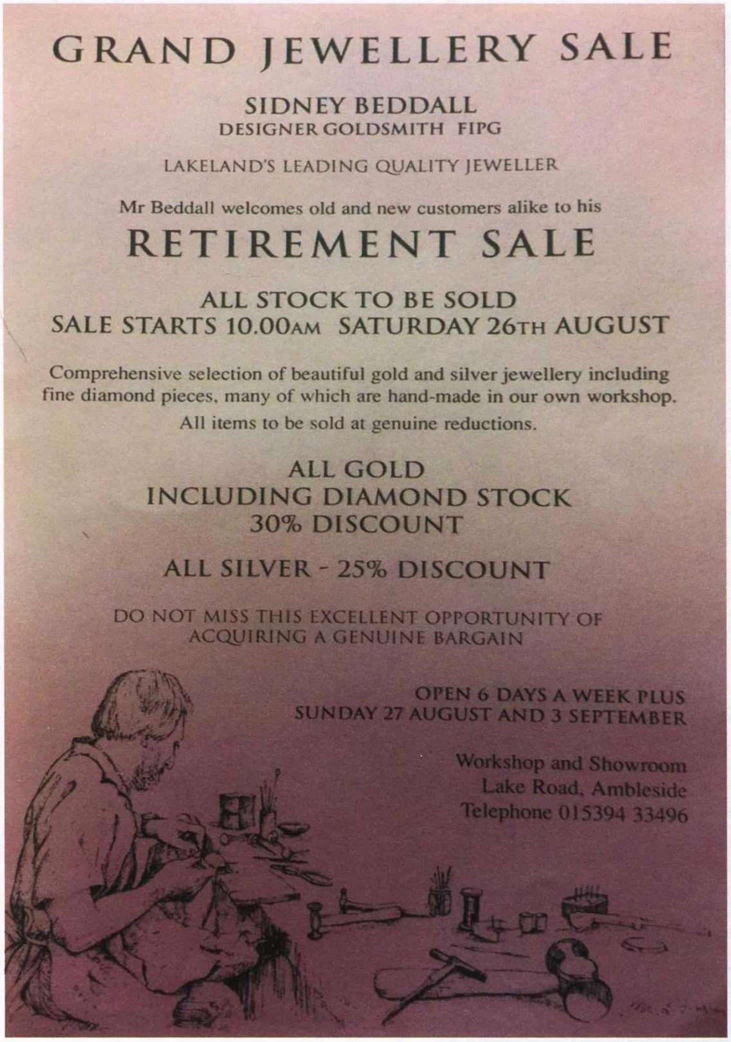
Here the 'GR 37'Sheffield stamp on the lead of the 200 oz tr weight is surrounded by three date stamps on the lead and a number of others on the brass base. 'B 49' is probably the second period within 1949, 'C 47' the third period within 1947; both contrasting with the more precise'12 61' which would be a testing or repair date of December 1961.

I packed the scale and the four 'small' weights well-wrapped in a sturdy cardboard box. Tony emailed me to say when it arrived safely by Air Mail (apart from being wet). I changed to a sealed plastic crate and a different courier for the second parcel. Customs procedures can sometimes be based on packed weight, so I was careful to document and double-check as much as possible.

The modern world of logistics was on our side, however, so I can report a reasonably happy outcome for 'Weights Around the World'.

And by the miracle of modern communications, Tony was also able to glean the vital information about the items' provenance. Provenance and a continuing history of items certainly add value to collectable items. The owner having died recently, they were put up for auction on EBay UK by a family friend, who was able to say they had been used by a craftsman gold- and silversmith for his whole working life.

Sidney Beddall was an apprentice at the famous British firm of Walker and Hall of Sheffield. In moving to England's North-West to run his own firm, he had preserved the robust scales for weighing out work pieces or weighing in purchases, together with the specialised Troy weights used in that trade. Tony followed up and found that there were some smaller troy weights from Sidney's stock that hadn't been in the consignment I'd sent. Rarities indeed!



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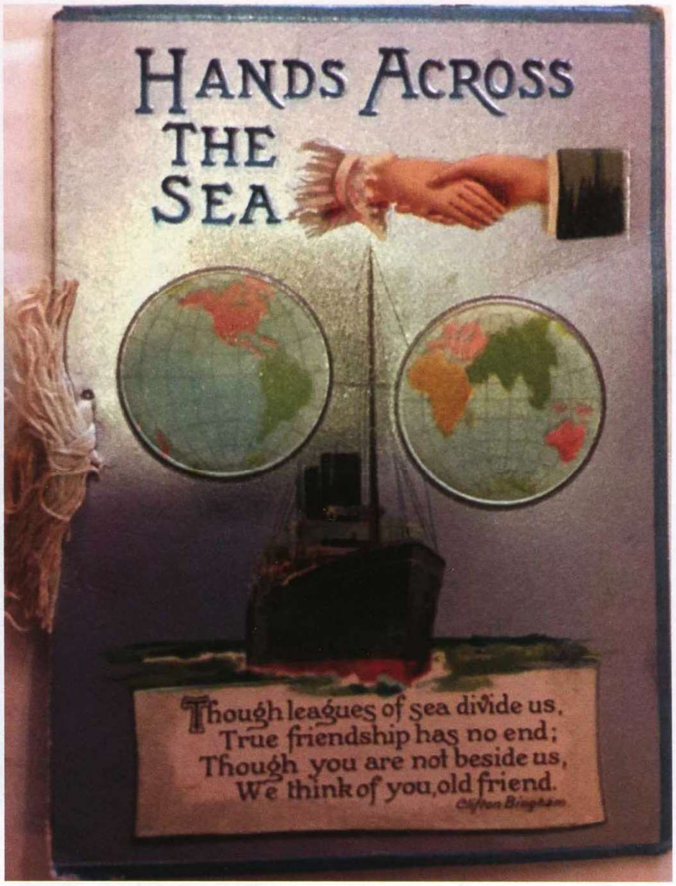
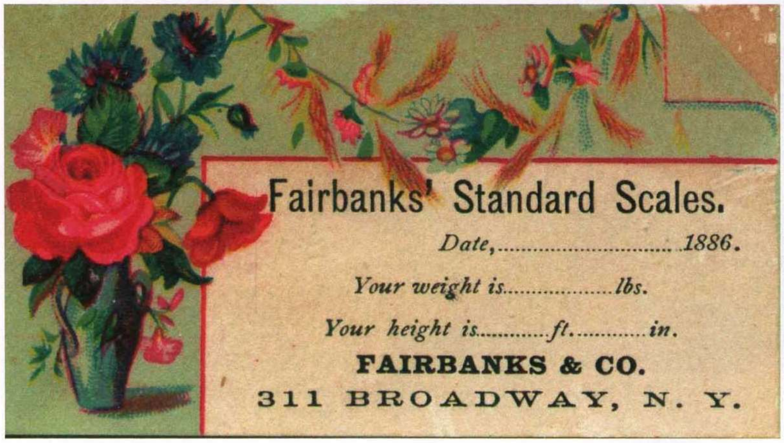

HANDS ACROSS THE SEA
Though leagues of sea divide us,
True friendship has no end;
Though you are not beside us,
We think of you, old friend.
Clifton Bingham

Old Advert

This trade card for Fairbanks & Co. is dated 1886 and advertises a furniture firm (see photo at bottom right) on its reverse. The front was never filled in, but was probably given out when a person was weighed on a Fairbanks scale at an 1886 exposition or fair.



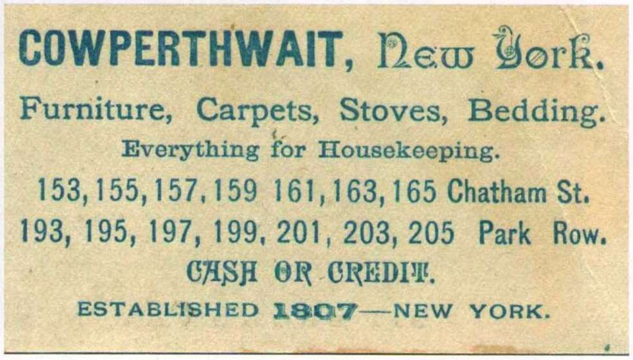
Fairbanks' Standard Scales.

Date,.............................1886.

Your weight is..................lbs.

Your height is...........ft............in.

FAIRBANKS & CO.
311 BROADWAY, N. Y.



COWPERTHWAIT, New York.

Furniture, Carpets, Stoves, Bedding.

Everything for Housekeeping.

153, 155, 157, 159 161, 163, 165 Chatham St.
193, 195, 197, 199, 201, 203, 205 Park Row.

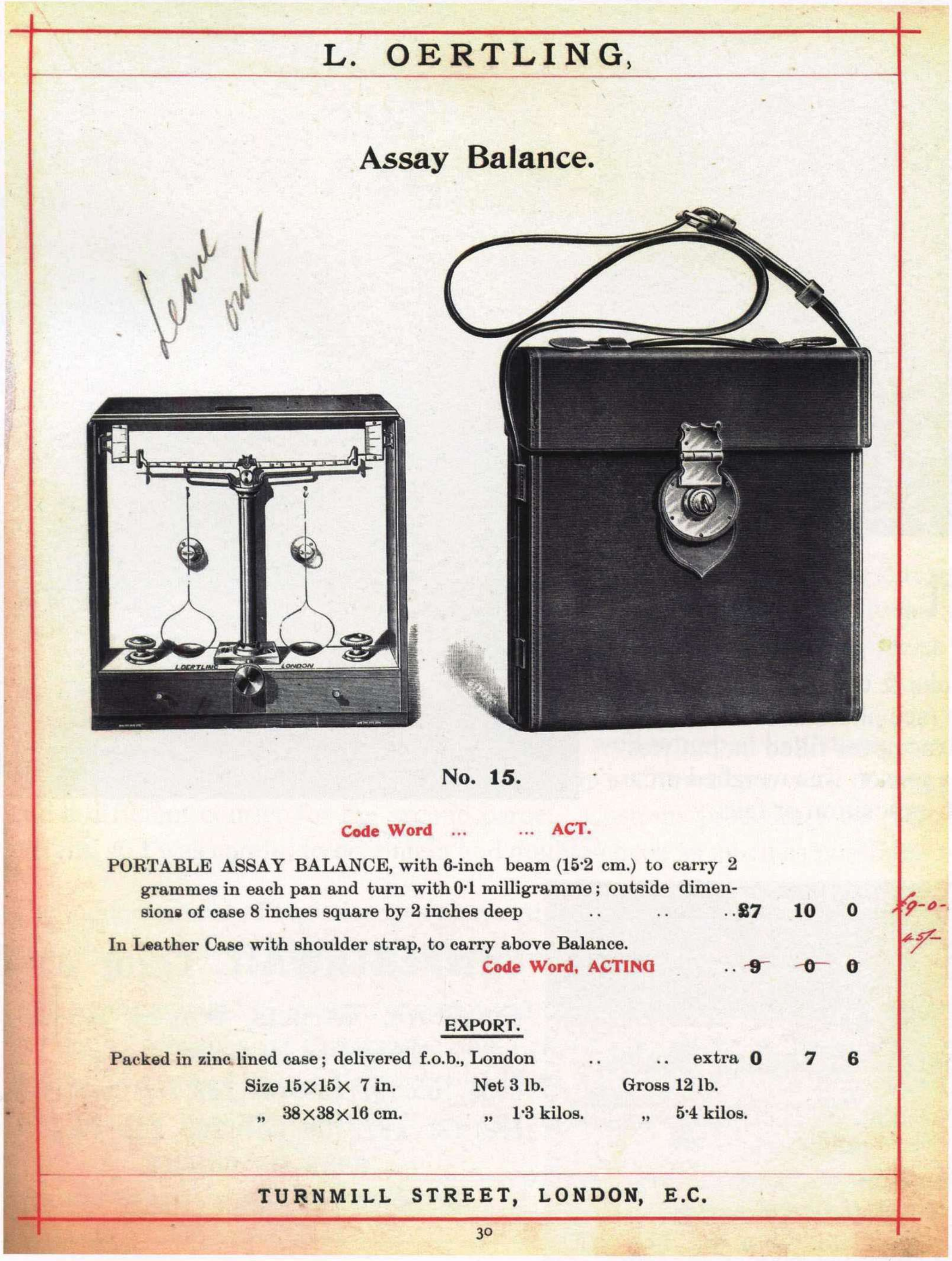
CASH OR CREDIT.

ESTABLISHED 1807—NEW YORK.

Oertling Model 15 Portable Assay Balance

BY BARRY J. OLIVER & CLAUS BORGELT

This article was written on the occasion of a request from C. Borgelt to B. J. Oliver over 6 years ago in April 2015. This contact not only resulted in further correspondence and personal visits, but also a deep friendship. Barry Oliver has been researching the Oertling balances for many years and working on his book *Ludwig Oertling, Balance Maker* that was recently published in November 2020. My Balance is a model manufactured by L. Oertling in London. Barry found, from surviving Oertling archives, that this model was in production between 1868 and 1915.



L. OERTLING,

Assay Balance.

Leave out

No. 15.

Code Word ... ... ACT.

PORTABLE ASSAY BALANCE, with 6-inch beam (15·2 cm.) to carry 2 grammes in each pan and turn with 0·1 milligramme; outside dimensions of case 8 inches square by 2 inches deep £7 10 0 £9-0-

In Leather Case with shoulder strap, to carry above Balance. 45/-

Code Word, ACTING .. ~~9~~ ~~0~~ 0

EXPORT.

Packed in zinc lined case; delivered f.o.b., London .. .. extra 0 7 6

Size 15×15× 7 in. Net 3 lb. Gross 12 lb.

„ 38×38×16 cm. „ 1·3 kilos. „ 5·4 kilos.

TURNMILL STREET, LONDON, E.C.

30

Figure 1. ≺≺ Model 15, on Page 30 of the Oertling 1909 priced catalogue.

This article was published in Nr. 136, Dec. 2020 issue of *Mass und Gewicht*. Used by permission.

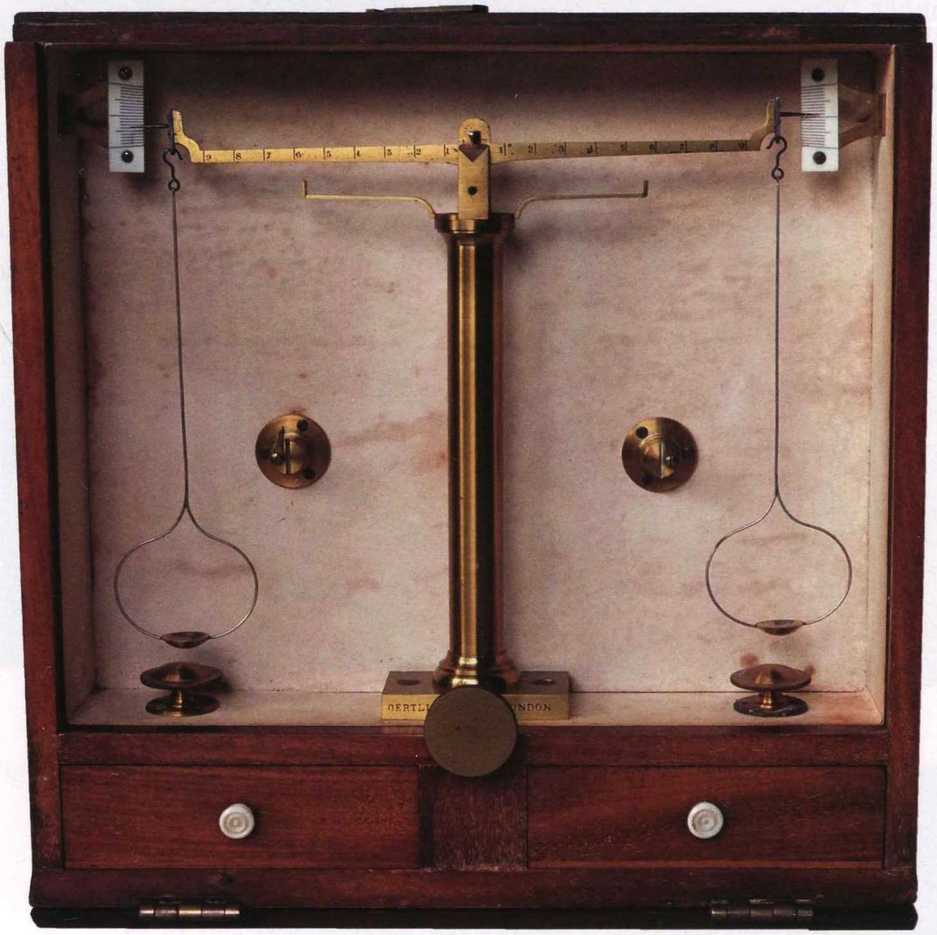


Figure 2. ≺≺ Assay Balance No. 15.

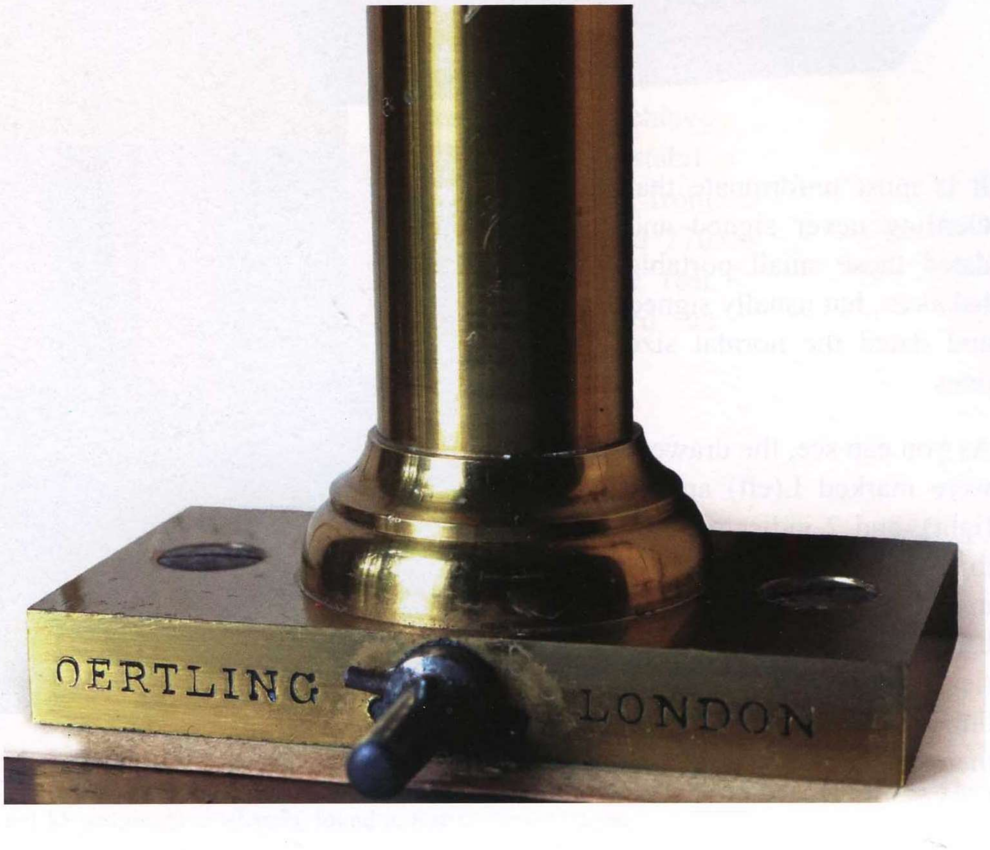


Figure 3. ➢➢ Detail of the stand.

This balance, with serial number **4685**, must date from about 1893. Unfortunately, this is just two years too early to be in the surviving factory records. But, the previous balance, **#4684**, which is an assay balance of another type, also survives, and carries on it in pencil the cabinet-maker‘s initials and a date July 1894. So, we can assume that this balance will be of a very similar date.

The pencil number **18514** is the Works Number, which records when the order to make the balance went into factory: late 1893. So, this one was made sometime between 1893 and July 1894, but most probably in July.

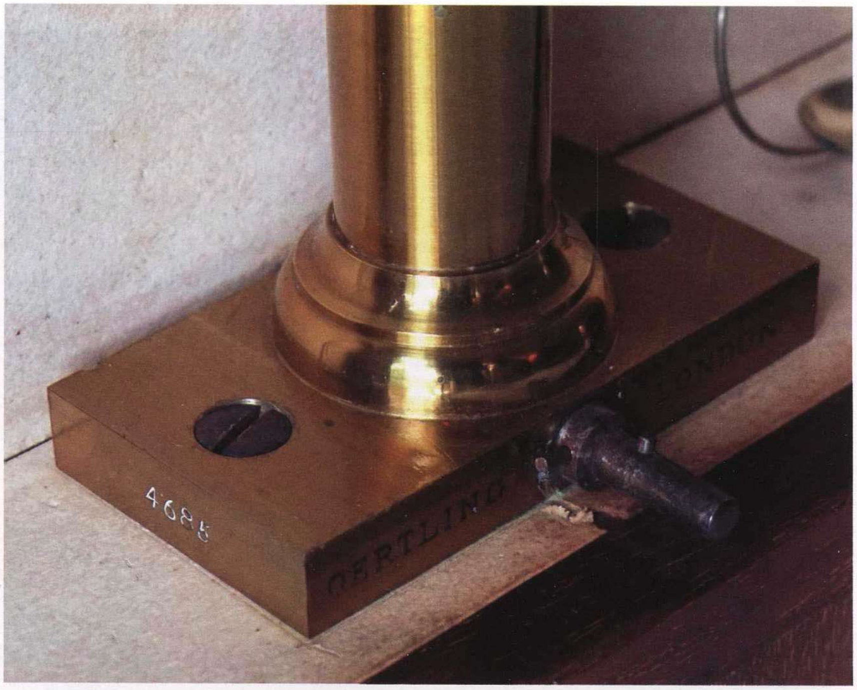


Figure 4. ▲▲ The serial number **4685** on the base.

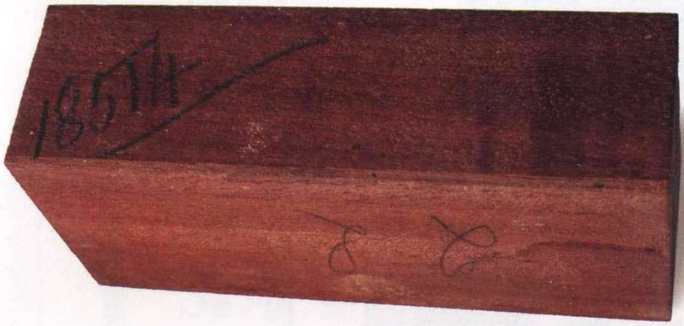


Figure 5. ◀◀ The Works Number 18514.

It is most unfortunate that Oertling never signed and dated these small portable balances, but usually signed and dated the normal size ones.

As you can see, the drawers were marked L(eft) and R (ight), and 2 indicates, that this case was number two in the cabinet-maker‘s batch of cases. Such a series normally consisted of three but never of more than six cabinets.

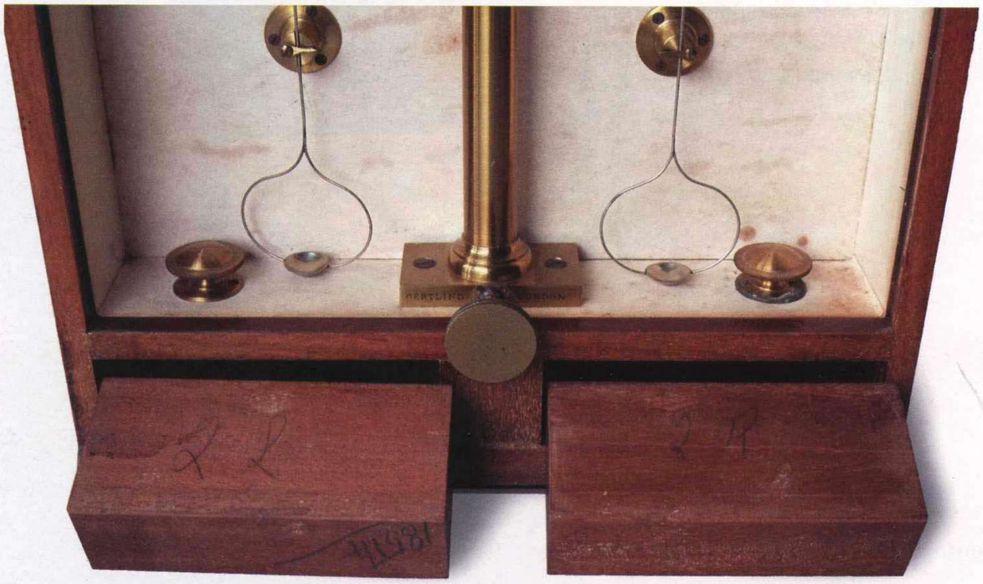


Figure 6. ▲▲ The marks 2 L and 2 R on the drawers.

In the drawers were some metric carat weights and the two loose assay pans ("skiffs") made of silver, and the release/arrest knob. There should also have been a small brass clamp for locking down the beam for transport when the case is folded up; this seems to be missing.

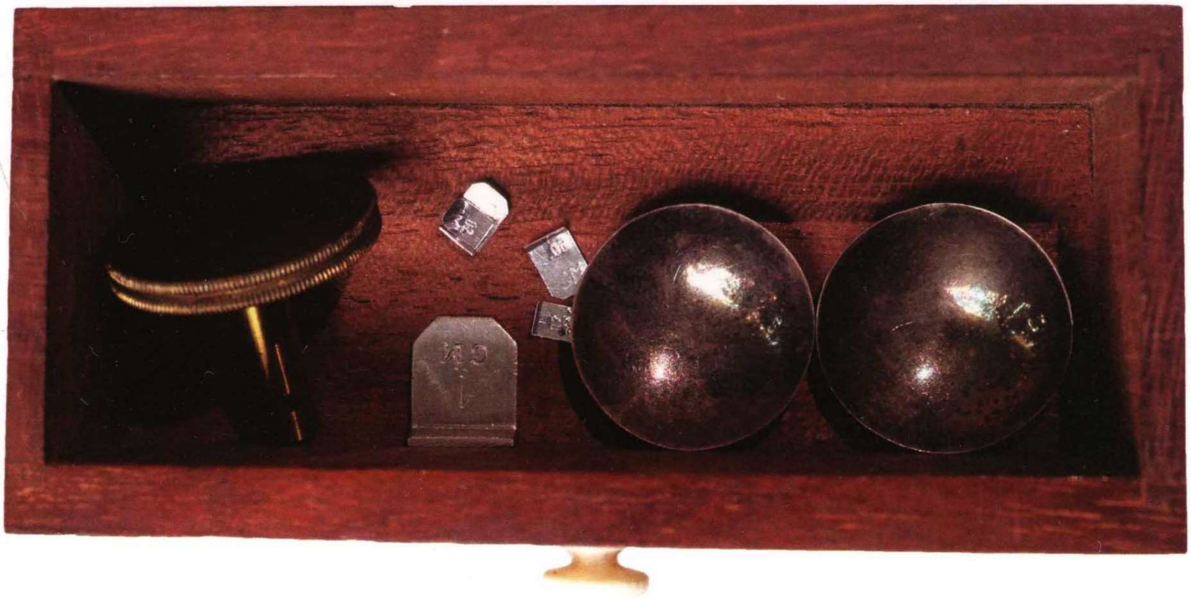


Figure 7. ⋀⋀ Contents of the drawer.

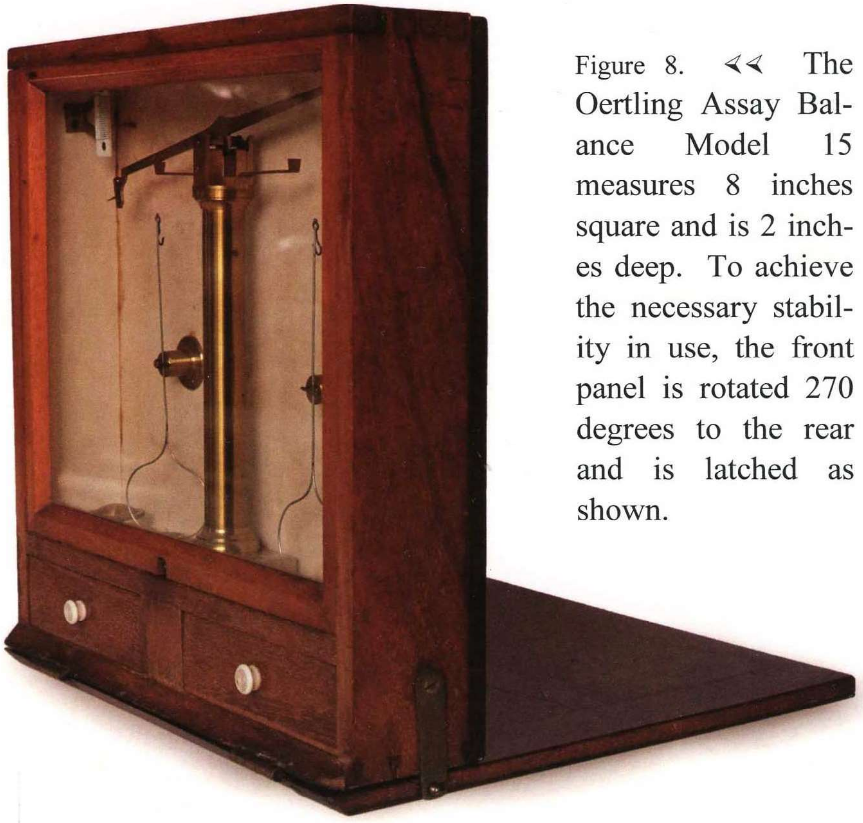


Figure 8. ≺≺ The Oertling Assay Balance Model 15 measures 8 inches square and is 2 inches deep. To achieve the necessary stability in use, the front panel is rotated 270 degrees to the rear and is latched as shown.

Footnotes:

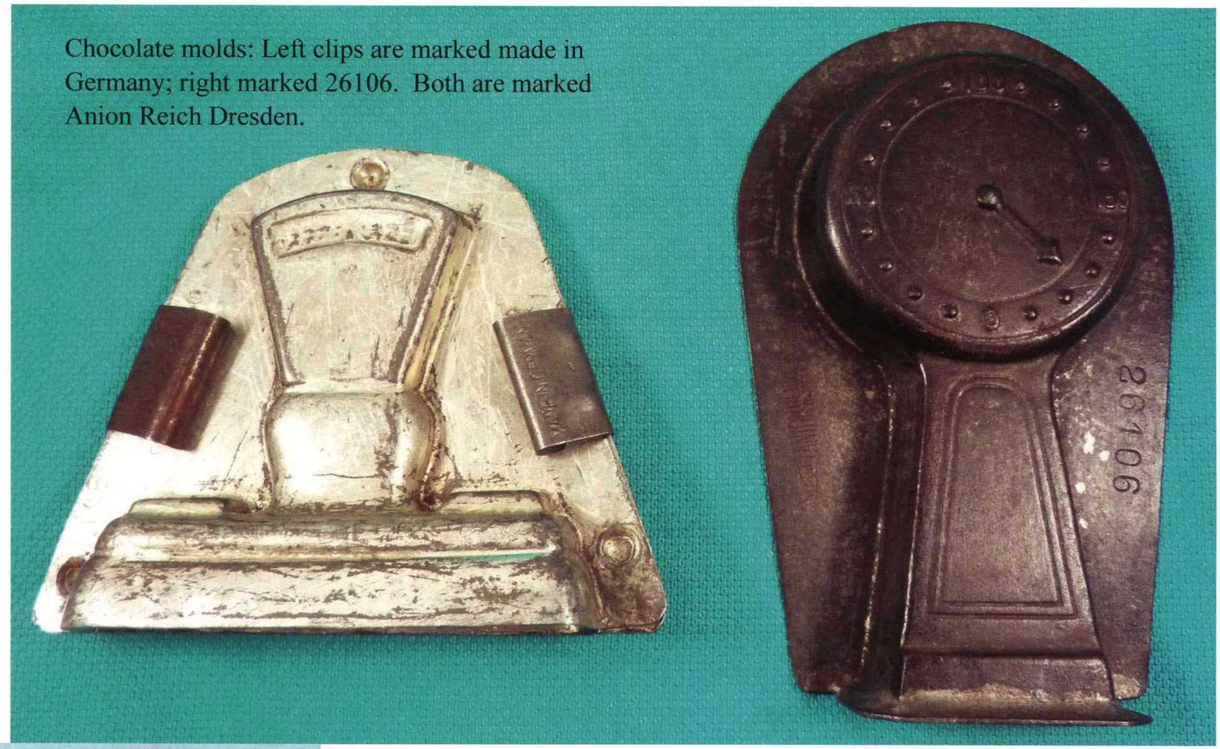
1 Contact: barry.oliver@keme.co.uk

2 Contact: claus.borgelt@mass-und-gewicht.de

3 *LUDWIG OERTLING, BALANCE-MAKER*; *The Man, His Company and its Products* (Microgramme, Leicester, 2020). There is much more information on the model 15 and its relatives to be found in Barry Oliver's book.

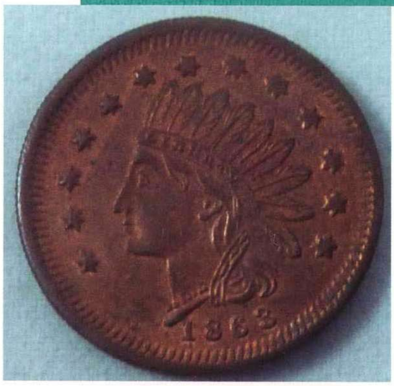
Showcase

Many scale collectors have adjunct collections of weighing advertisements or other useful items depicting scales. Here are a few such items.

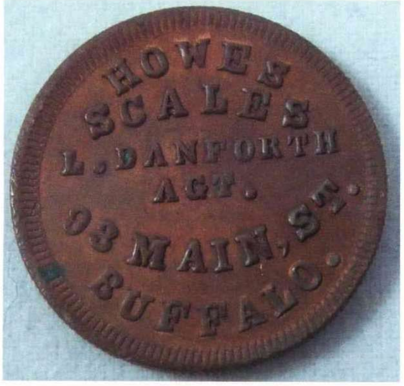


Chocolate molds: Left clips are marked made in Germany; right marked 26106. Both are marked Anion Reich Dresden.

Wikipedia states, *Civil War tokens are token coins that were privately minted and distributed in the United States between 1861 and 1864. They were used mainly in the Northeast and Midwest. The widespread use of the tokens was a result of the scarcity of government-issued cents during the Civil War.*



This Howe's Scales Token was issued during the American Civil War and is made of copper.



Brass token good for weighing one load on the City Scales in Fargo, North Dakota. The reverse is blank.

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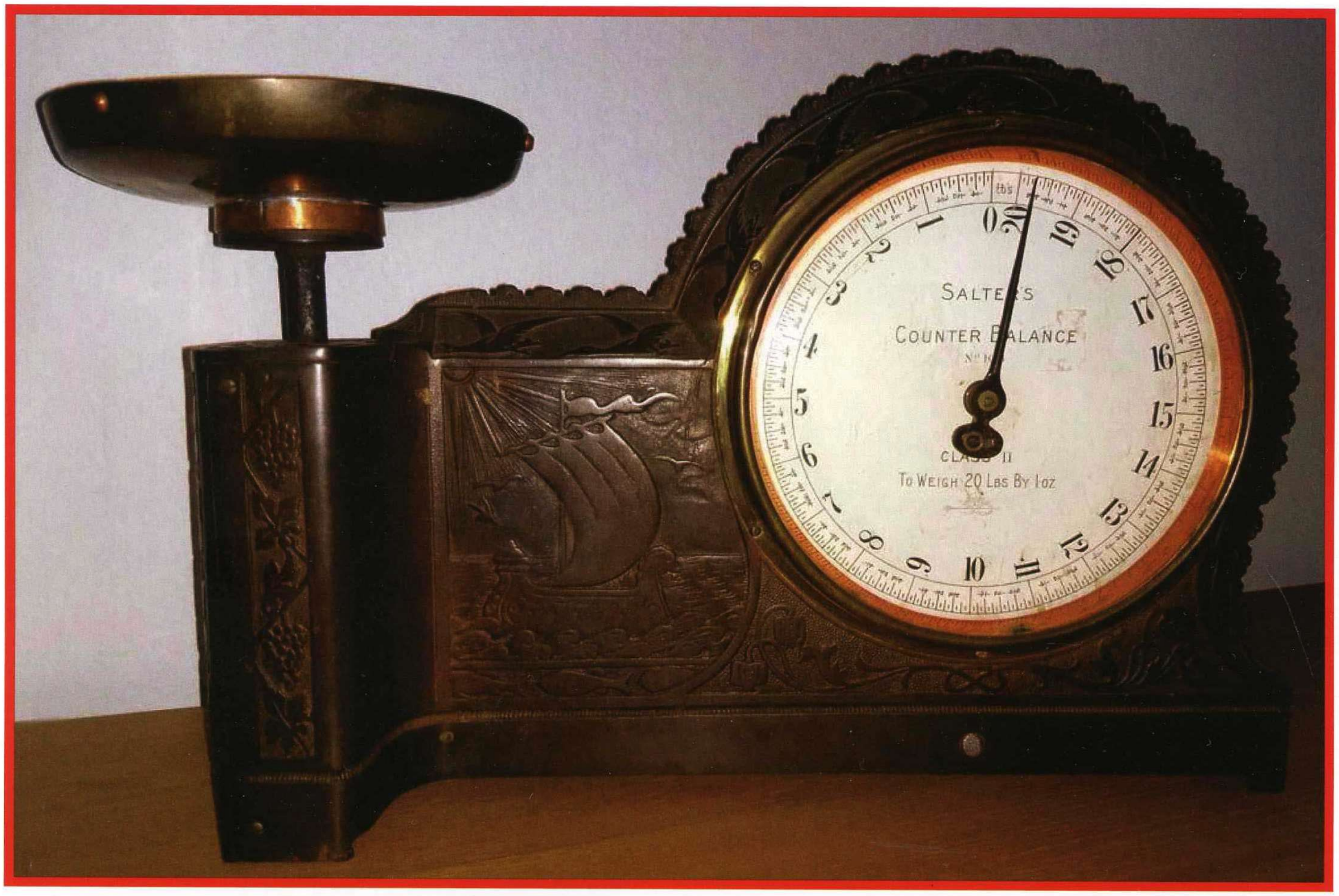
PAGES 4833 - 4860



Cover Picture

Salter made this Counter Scale for butchers, fishmongers, greengrocers, etc. Shown in the company's 1920 catalog, it has a capacity of 20 pounds by 1 ounce. It was available in the bronze finish shown here and in a nickel plated finish. Another option was with an additional dial facing the customer. It measures 20 inches wide and about 13 inches tall. A half-Roberval and spring scale; this is thought to be the only one known. See also EQM 1983 Issue 2 page 546-547 and EQM 2003 Issue 3 page 2830.

Eric & Judy Soslau Collection.

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Another Early Multi-Coin English Balance Maker -Jesse Ramsden
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4859-4860

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Photos are best in 300 DPI Jpegs in a separate file with a maximum of 3 photos per Email.

Webb's 'White Monarch' Dispensing Scale

BY MIKE SHARPE

Barry Oliver's excellent new book *Ludwig Oertling, Balance Maker* contains much information over and above the story of this famous British Firm.

In Chapter 32, Barry provides quite a thorough history of W A Webb Ltd, of Ilford, near London, a contemporary and competitor of Oertling in the 1950s.

I was particularly intrigued by the notes that Albert William Beal became W A Webb Ltd's principal balance (and scale) designer, and that "his style is somewhat unusual, even eccentric in places" (page 538). Barry goes on to say that *The White Monarch was Beal's best scale design, created somewhere between 1933 and 1937 as a superior dispensing scale for pharmacies* (page 540). In researching, I found an example of this item online.

Straight away, it was clear that a major part was missing – the white shroud or 'umbrella' piece covering up the silver-coloured horizontal beam. And Barry is right about the original case the scale came in, which was cheap and nasty as illustrated.

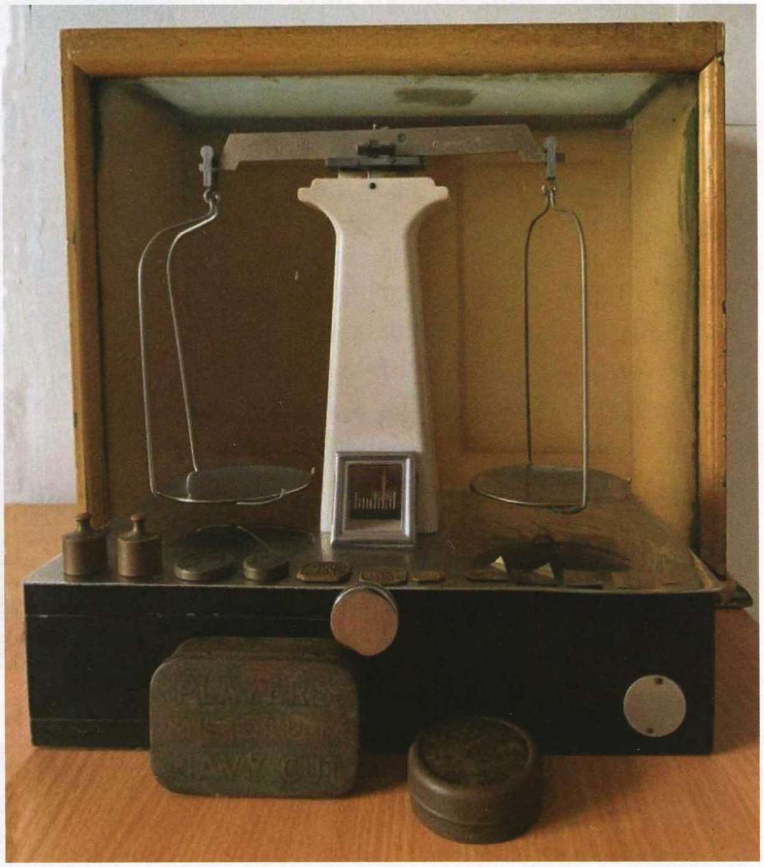


Figure 1. ⩓⩓ The W. A. Webb Ltd White Monarch scale as pictured on ebay.

But, because I'm more interested in investigating design features by taking scales to bits than collecting for show, Reader – I bought it!

The provenance was fairly well-confirmed by the ebay seller, who said it stood in a corner of a disused textile mill in the North of England for some years. Originally used for weighing out dyes and other chemicals, it came with two tins of grain weights, 37 in all, ranging from 1 grain (64.8 milligrammes) to 500 grains (32.4 grammes, just over 1 'ounce Apothecaries'). You may recall that in the olden days there were 480 grains to the Troy and Apothecaries' ounce.

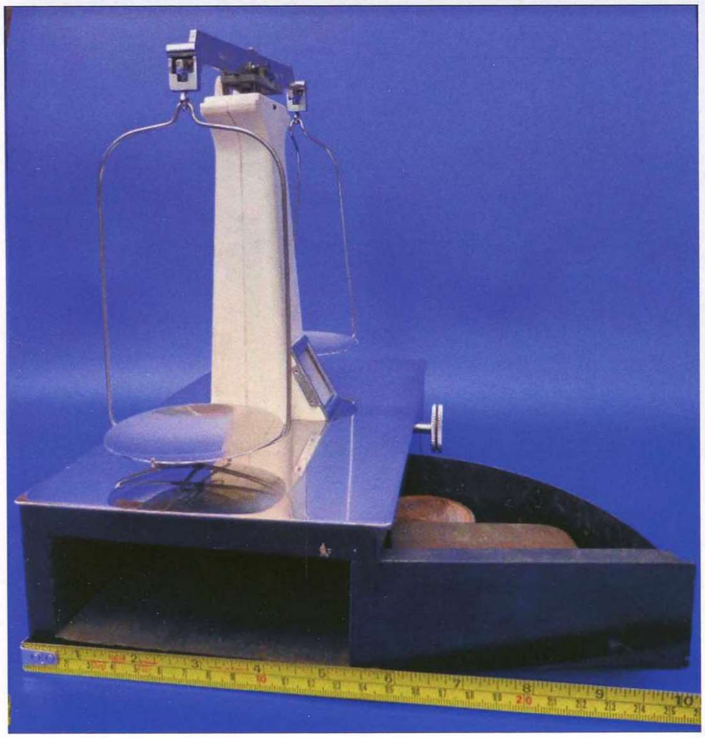
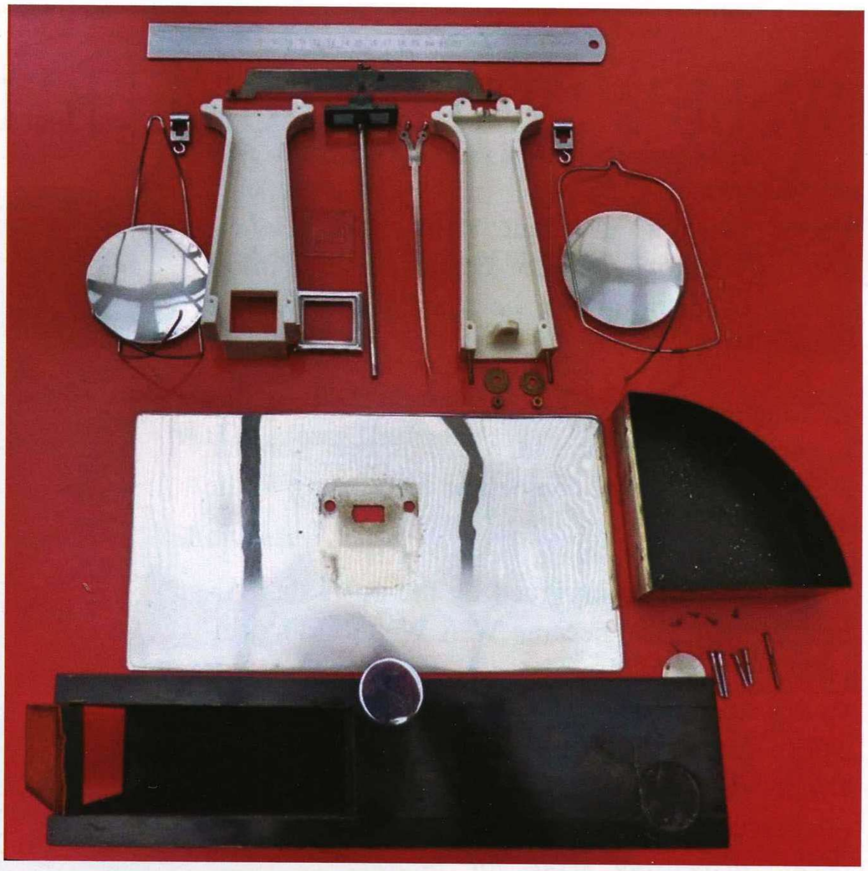


Figure 2. ≺≺ The scale after purchase and cleaning, showing the distinctive drawer for the weights.

Figure 3. ➢➢ Webb's White Monarch as a kit of parts – about 50 items in metal, stone, wood and plastic.



Once it had arrived by post (minus the case) I was able to appreciate the functionality of the design, if not the condition. And it's a good exercise to strip down a simple scale and rebuild it, even if it doesn't work.

About 10 inches wide, 8 inches tall and 4 inches deep, this was a fairly standard 2 ounce capacity scale with a relieving mechanism. It bore a UK Government stamp and 'Class B' designation. Although the maker's name was clearly marked on it, there was no serial number. Stamped on the beam and the pointer were the figures '14', which I take to be an assembly number.

As Barry rightly points out, the beam is the key component in a balance or scale of this type.

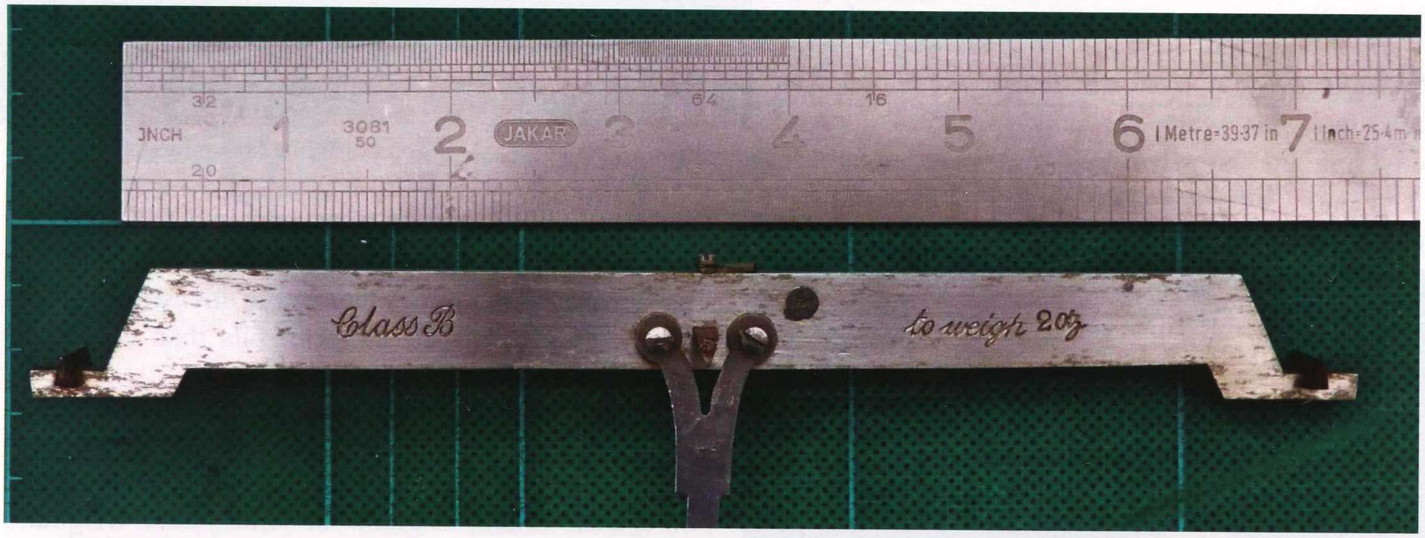


Figure 4. ⮝⮝ The front of the beam showing its length, the positions of the knife-edges, the government stamp, the attachment of the pointer, and the small 'balance flag' on the top held by a set-screw.

Despite the photo, the knife-edges are parallel! It's just my fish-eye lens. It's a seven-inch beam from left Terminal Knife-Edge (TKE) to right TKE.

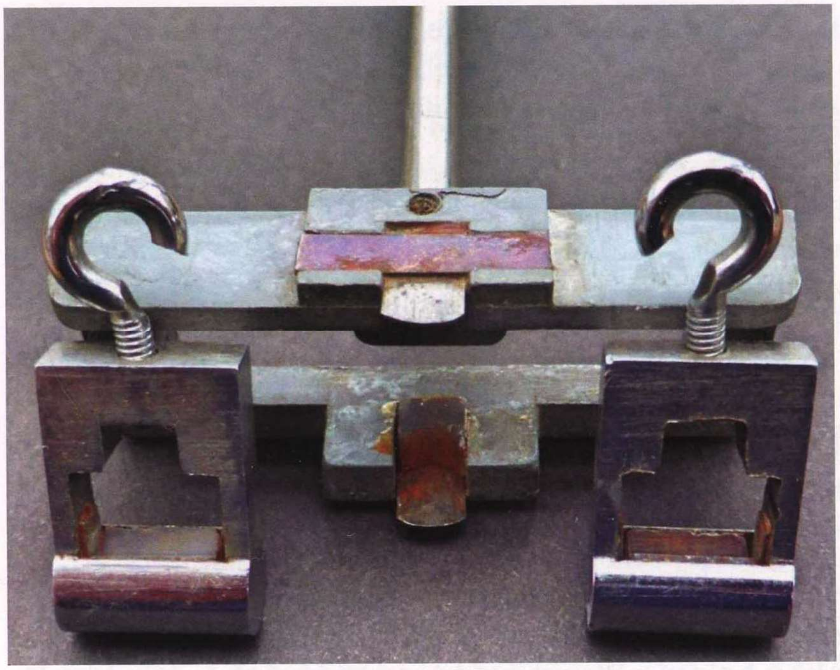
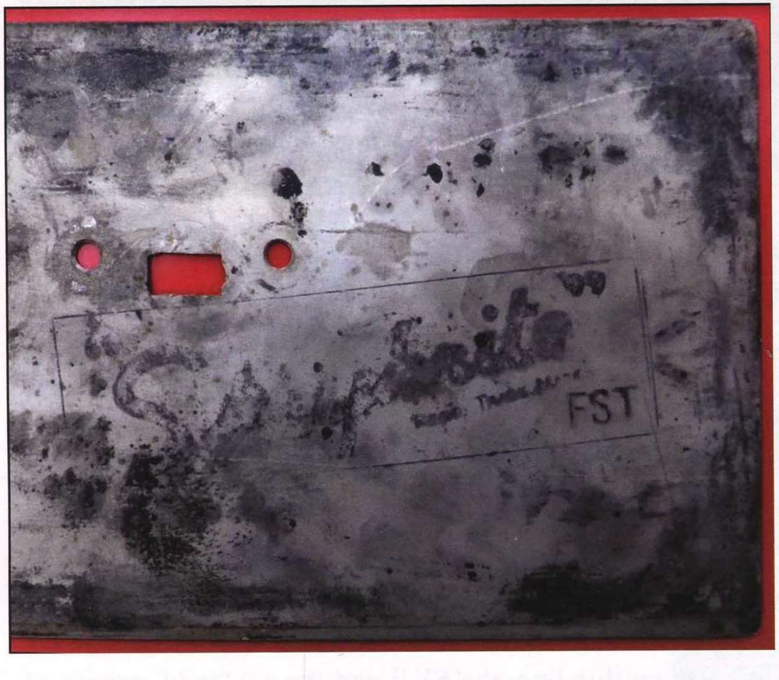


Figure 5. ⋀⋀ The centre bearing is held in the relieving mechanism by metal strips. The long shiny rod is usually vertical. I've juxtaposed the two shackles to show the V-shaped bearings. The right-hand shackle is quite crudely machined.

One interesting test on scale materials is to see which are magnetic. On fine balance work one would expect such parts to be kept to a minimum, so that magnetic forces don't interfere with the weighing process. Here the beam is Duralumin (a non-magnetic aluminium alloy) but the three knife edges are magnetic steel. Oertling's precision balances used agate knife-edges. On Beal's scale agate appears in the bearing surfaces.

The agates are small but very hard. On the Mohs scale of mineral hardness agate is around 7, and is only a little harder than steel (about 6.5). Using agates for bearings rather than steel gave a slight advantage in wear characteristics. These were critical components which balance manufacturers bought in. Sometimes craftsmen applied finishing processes of high precision, the success of which could make all the difference to the performance of the weighing machine over its lifetime.

The largest piece of metal on the assembly is also steel:



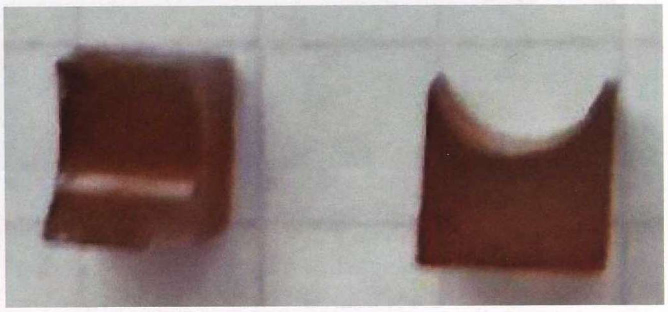


Figure 6. ⋀⋀ The two semi-circular centre bearings after extraction from their mounting. They were held tightly, and cemented into the mechanism. Each grid square on the paper is 1/5 of an inch.

Figure 7. << The underside of the bright steel baseplate after removal from the wooden stand. It measures 11.5 x 6 x 0.1 inches (295 x 153 x 1.5 millimetres).

'Staybrite' is the trade name on the underside of the base plate, and this is a non-magnetic stainless steel used widely in British industry from about 1924 . It is an 18% nickel/8% chromium (added to the 74% steel), patented by the famous Firth Brown steelmakers of Sheffield, England.

Beal's design used a dense white resinous plastic material, similar to Bakelite, to form the stand for the scale. Part of this plastic assembly holding the long shiny rod of the relieving mechanism was broken, possibly by rough handling. This breakage also made the scale difficult to operate, and difficult to repair.

This white plastic contrasts with the white enamel of W & T Avery's competitor pharmacy balance. I think the whiteness / bright silver finish was associated with hygiene in a dispensary, but it was also practical for seeing where spills and powders might have lodged.

The 'White Monarch' evolved into the Oertling 'J10' after W A Webb Ltd. opted for a voluntary takeover by Oertling / De Grave Short in 1961.

A Note on Scale Design (in theory)

Barry Oliver provides a full scientific and academic 'theory of the beam' in his book. Ludwig Oertling himself contributed much to the understanding of how precision weighing works, as he was working with some of the ground-breaking scientific experimenters of the British Victorian age.

Put simply, the longer and lighter the beam within a balance or beam-scale, the better able it will be to sense slight differences in masses placed on it. Designers such as Beal made engineering compromises and decisions on accuracy, repeatability and sensitivity (also known as discrimination in modern parlance), bearing in mind the practicality for the end-user and the cost.

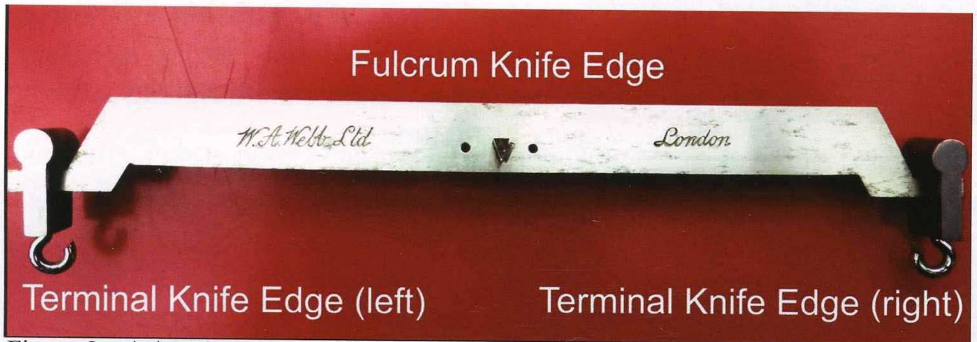


Figure 8. ⮝⮝ The reverse side of the beam, with the shackles in place. Draw a line from the centre of the circular part of the left hand shackle to the corresponding part of the right hand shackle. You can see that it cuts through the Fulcrum Knife edge above where the FKE would contact its own semi-circular bearing.

The example of the 7-inch mass-produced beam within the White Monarch shows a concern for good length with excellent lightness in the use of aluminium alloy. Duralumin is about a third of the density of brass, which was a favoured non-magnetic beam material up to the 1920s. Duralumin also has a higher tensile strength.

'Flexing of the beam under load' is a small but interesting effect which can mean the whole weighing instrument is better at sensing those small differences in mass at lower weights rather than higher ones.

Thermal expansion can also have an influence on the weighing – again, Duralumin is superior to copper-alloys, suffering less from day-time/night-time and summer/winter cycles of heat.

The shape of Beal's beam is quite angular, and can be contrasted with other designers' solutions to the balance of forces.

The line between the two terminal knife edges (TKE) has an important influence on the sensitivity / discrimination of the beam. I can see where the steel TKEs have been drifted into place within the shaped slots die-cast in the aluminium. On measuring, the line is about 2 millimetres above the fulcrum knife-edge (FKE). Precision weighing depends on a certain relationship between this line, the FKE and the centre of gravity of the beam assembly. This line will move downward under load, and if it goes too far the sensitivity will decrease, even though the beam is physically undamaged.

Hence the 'capacity 2 ounces (avoirdupois or 'Apothecaries')'.

The legal constraints on using a beam for trade included its sensitivity when new and when inspected after months or years of constant and perhaps unsympathetic use.

Beal's scale in this case would be expected to demonstrate its sensitivity by a noticeable difference in the indication (using the pointer and see-through glass chart) when the mass changed by 0.4 grains (25 milligrammes). This applied when the pans were unloaded and when fully loaded with 2 oz Apoth on each side (62.2 grammes).

The design parameters were likely to be much tighter than the legal tolerances – a sensitivity calculated at 0.1 grains perhaps?

All in all, a very interesting engineering solution. It's good to know that when pharmacists weighed out the medicines of the 20th century they routinely worked to such high accuracy!

References;

1. Oliver, Barry J *Ludwig Oertling, Balance-Maker, L Oertling,* pub Microgramme, Leicester *(2020), ISBN 978-1-5262- 0842-2*
2. UK Government Weights & Measures Regulations 1907, applicable until revoked in 1963/4.

J. P. Aeckersberg's German Coin Scale Birth of the Solingen Style

BY GREGG MOTTER

I began my weights and measures collection focused on Boxwood rules utilized in a variety of trades. In the course of this quest, I met a very knowledgeable gentleman who could look at a tool, tell you when it was made, company history, and how it was used "back in the day." Over the years, we had many fascinating discussions. On a recent trip to his treasure-loaded basement, he opened a crate of antiques imported from Europe 40 years ago! Among the treasures was this J. P. Aeckersberg coin scale he purchased from an elderly lady in Germany whose family were merchants, and used this scale over many generations.

This set contains a simple iron beam and pointer with round brass pans hung on cords and a weight set bearing fascinating names such as Ducat, Pistol, Carle, Ryder, Sever, etc. I was hooked. That began the transformation of my collection from measures into weights and measures. For this article, I will focus on this German coin scale made by J. P. Aeckersberg, and his place in history. See Figure 1. This set is typical of many thousands of coin scales produced by Aeckersberg, and others, during the last half of the 18th Century.

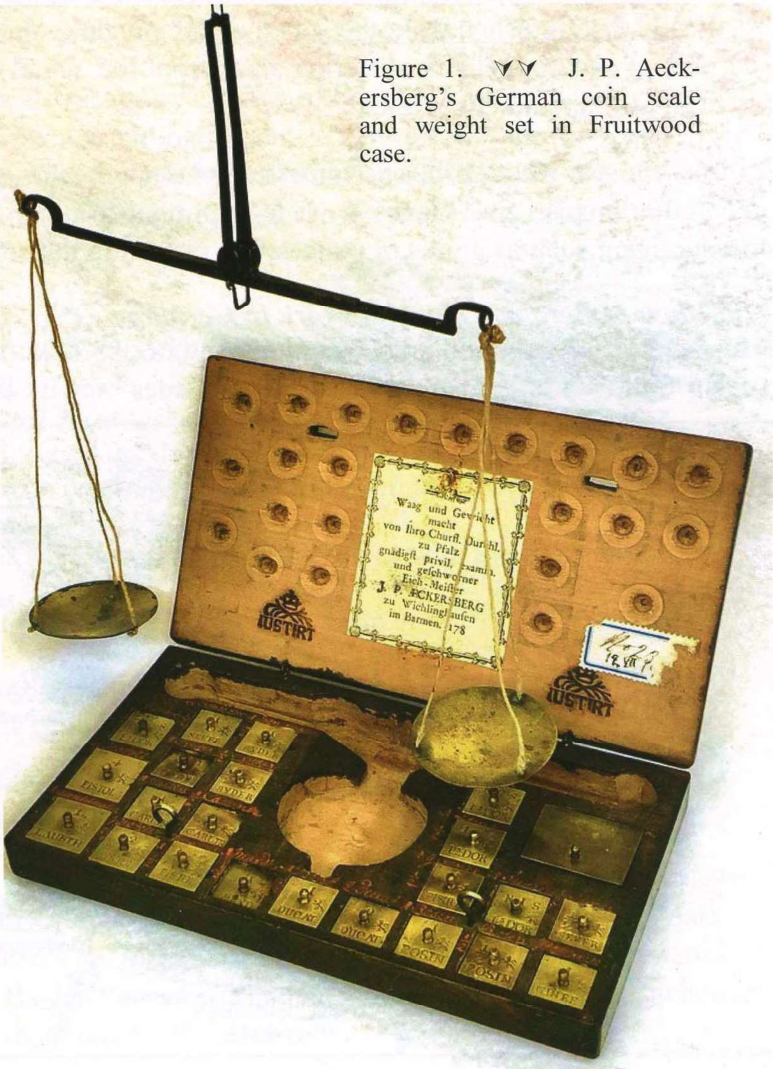


Figure 1. ▼▼ J. P. Aeckersberg's German coin scale and weight set in Fruitwood case.

Historical Background of Coin Scales

At this point, it is helpful to look backwards in history to when money came into common usage in the 6th Century B.C. Since then, money has been closely tied to the weight of precious metals from which it was minted. Electrum was the first precious metal used for coins, and latter coins were minted from both gold and silver.

Merchants, Moneychangers and Tax Collectors had to check the weight of coins they accepted to prevent being cheated. Coin clipping and counterfeiting are as old as commerce itself. At times, these practices were so prevalent that few full weight coins remained in circulation, and undermined public confidence in the value of circulating coins! Additionally, there were vast quantities of coins in circulation that were badly worn and under the desired Least Common Weight (LCW). Clever individuals searched for coins minted heavier than the legal target. These persons would simply "clip" the coin to proper weight, and sell the surplus precious metal for an added profit.

Specially produced delicate, sensitive, portable scales were produced for the examination of coins for their full weight. Special weight units were fabricated in Roman times called *exigia solidi* (from exigire, to adjust). Each weight represented a specific coin. The standard weights were usually made of brass or bronze and kept in safe places such as temples, Emperor's palaces, churches, and government buildings.

Each coin weight had to meet three essential specifications:

1. Represent the exact weight for a specific coin
2. Weight representing a particular coin needed to be easily recognized by a user due to widespread illiteracy
3. Easily distinguished from the actual coin by making the exagia square, hexagonal, triangular, rounded corners of square weights, differing sizes from the actual coin they represented, blank reverse side of round weights, tapered edges, etc.

Coin scale sets were produced consisting of scale beams, pans, and weights stored in easily transported and decorative boxes. See Figure 1. It is important to note, the weights were not indexed to a defined unit of measurement such as grams or ounces, but instead to the corresponding coin.

Dukedom of Berg & County of Mark in Germany

This area of Germany near Cologne has long been renowned for its metal working industries, especially edge tools. Solingen is known as the "City of Blades" for its famous swords and blades. In Medieval times, the swordsmiths designed the coat of arms for the town, showing two crossed swords, and is utilized to this day. Solingen swords were traded and prized possessions all over Europe. Late in the 17th Century, a group of swordsmiths from Solingen broke their guild oaths and took their sword-making secrets to County Durham in England! Today, Solingen is known for knives, razors, scissors, shears, and surgical instruments.

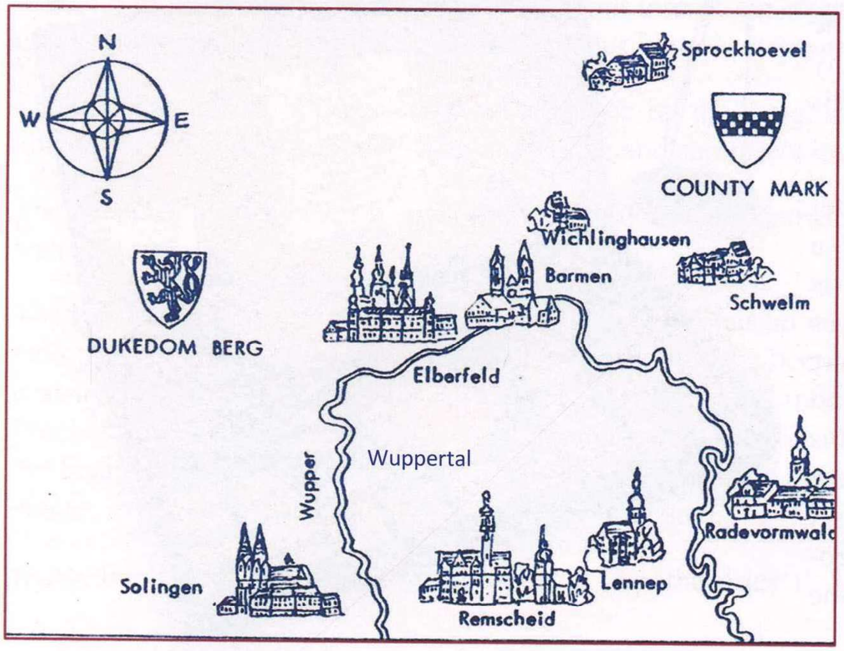


Figure 2. << German Coin Scale production included Lennep, Wichlinghausen, Solingen, Elberfeld, Sprockhõvel, Remscheid and Barmen; all within ~12 miles of each other. Solingen was the preeminent town making coin scales in Mark. From EQM page 26.

This mountainous region was rich in natural resources such as iron ore, coal, and fast flowing water to power mills and tilt hammers. Additionally, the area was crisscrossed with trade routes leading to industrial centers and market towns that created a great circulation of money. Every Merchant, Tax Collector and Money Changer needed a scale to deal with the various coins coming in from all over the European continent. Coin scales contained large numbers of weights to cope with coins no longer being minted, but remaining in circulation for decades. (People typically did not turn in old coins when new ones were issued.) Figure 9 is an example of the variety of coins represented in a typical set. These scales were very expensive (hence some sets contained half the weights), and were handed down generation-to-generation within money handling families; just as my Aeckersberg scale had been handed down.

Money scales from the Dukedom of Berg and the County of Mark (Berg & Mark) were produced during the war and plague driven turmoil between the Middle Ages and the early stages of the Industrial Revolution. Under the rule of Karl Theodor of Pfalz-Sulzbach (1742-1777) an industry of coin scales and weights was developed in Berg. The maker of my scale set, Johann Peter Aeckersberg (1707-1790), was the very first scale maker to receive permission to make these unique and famous coin scale sets, and worked in the town of Wichlinghausen. Refer to Figure 2.

In nearby Mark the King of Prussia did not sit idle and watch this industry develop in Berg. He granted special privileges, and lured Abraham Kruse (1745-1814) to transfer his business to the Mark town of Schwelm in 1772. See Figure 11 for an example of his work. Kruse's success stimulated production in Mark, and especially the Poppenberg family who worked in Sprockhoeval.

J. P. Aeckersberg was most probably a skilled scale maker by 1728 working as a Journeyman in another scale-maker's shop located in a town other than Wichlinghausen. There are no known scales by Aeckersberg from this period of time. We do not know who he was married to, but quite possibly, to the daughter of his Master as this was very common at the time. Refer to Figure 3 for a discussion of a scale-maker's training.

Birth of The Solingen Style Coin Scales

Aeckersberg's initial coin scales were produced in 1749, and were very much patterned after the coin scales of Cologne. In a very short period of time, he established the distinctive characteristics for all Berg & Mark coin scales independent of maker for 25 miles around which include:

- Rectangular wood boxes produced from Fruitwood or Maple
- Secured with two brass latches with brass loops protruding through slots in the cover
- Exterior of the box stained black or dark brown
- Square brass weights with knobbed tops that were tapered on all four sides with the indication of the coin they represented stamped on top
- Simple iron beam and pointer that was hand-held in use by a leather strap
- Plain round brass pans hung on three cords
- Each weight recess was labeled in hand-written red ink
- Scale-maker's trade label pasted to the inside of the box lid

Refer to Figure 1 for an example of J. P. Aeckersberg's work, and Figure 11 for several examples of other notable coin scale makers working in this area.

From 1760 onward, the Dukedom of Berg had a thriving industry producing gold and silver coin scales that shared many similarities with the earlier Nuremberg scales. Later on, in the County of Mark alone, production volume reached 500 sets of scales per month by 1783! These were used in Germany, and exported all over the European continent. By 1820, production began to decline, and ceased when the gold and silver coins lost their significance in commercial transactions.

German Guild System

Germany was split into principalities, dukedoms, etc., but there was a strong Germanic work ethic across the country. It is difficult to find solid information about German Guilds. Each major town had its own set of rules concerning who could work, under what conditions, and stipulating the quality of training and time required to become a Master. In preparation of this article, it was difficult to find any specific information about the Berg & Mark Guilds. Therefore, I have included some fascinating highlights of the Augsburg Guild system (~500 km away) as a working example. See Figure 3.

Figure 3: Insights Into the Structure and Operation of a Typical German Guild

Herberg:
- Was an inn, lodging house, master's house, or an inn owned by the Guild
- Provided a home for apprentice and journeymen without a long-term relationship with a master, and thus had no residence

Progression from Apprentice to Journeyman:
- A son was placed with a master through negotiations between parents, or "friends" (befreundten), and the prospective master
- Apprenticeship was five years, with a Lehrgeld (fee); six years with no Lehrgeld to the master
- A master's son only served a three-year apprenticeship with no Lehrgeld
- Foreign apprentices were required to produce letters (briefliche Urkunden) attesting to honorable birth. A German only had to produce two citizens (Mitburgern) to attest to their respectability of birth. (Illegitimate children were not allowed to be trained, or be in the Guild!)

Typical Journeyman Training Requirements:
- Ten years, including the apprenticeship
- Training as a journeyman varied considerably. A master's son was most privileged, and needed only three years in addition to three years apprenticeship. Favoring of sons of masters was nearly universal among early modern guilds

Typical Master Training Requirements:
- Candidate worked a minimum of two years for one or two citizen masters providing exposure to local customs, and opportunities for the guild to scrutinize the character of the potential master
- A masterpiece was made at the master's home or, if the journeyman had no master, at the Herberg
- Sworn Masters inspected the piece - "a Kasten of skillful work", at least three times, and inspected it again upon completion
- Finished work was presented to Verordnete of the guild, who were paid one florin "for their trouble" by the journeyman. Their responsibility was to approved journeyman and masterpiece. If they judged the journeyman worthy (gnuegsam), he was thenceforward called "master", "and held equal to all the other masters, and recorded in the guild's Book of Masters"
- Marriage was a requirement before becoming masters. Note: J. P Aeckersberg's daughter Maria Caterina married Johann Melchior Kruse Sr. who was apprenticed to her Father!

Rules for Journeymen Seeking Work:
- Not allowed to seek out work on his own
- Both master and journeyman had a right to reject each other
- If the journeyman refused work, he had to wait a week to be reassigned
- After a journeyman refused work three times, he lost right to choose, and was assigned anyway

Rules for Masters Seeking a Journeyman:
- Masters could only hire at the Herberg
- When a master needed a man, he provided a note to the Zuschickmeister ("placement master"), who operated the Herberg, who posted a list of openings each week
- No master could seek out a specific journeyman, and the fine for hiring without Zuschickmeister's knowledge a florin; a lot of money at the time
- Both master and the journeyman had a right to reject each other
- A hiring master came to the Herberg to interview a prospective journeyman at a table. If they rose from the table together, agreement was sealed; otherwise, there was no deal
- Hiring was done Sunday and Monday mornings. If a journeyman had not been placed by Monday afternoon, he had to wait until the following Sunday to seek work again

Guild Shop Rules:
- Every shop was ruled by the master, one master per shop, and one shop per master - all who worked there were under his authority
- No abrupt departures were allowed; the apprentice could not leave without permission; the journeyman could not leave without due notice. The master could not terminate their employment without cause, and even then, the employee had the right of appeal
- The ranks of apprentice, journeyman and master served as points of control, socially and economically, for even as each status could be granted (under terms), it could be revoked as punishment

Documented evidence illustrates the Guilds were a vital part of every town, and Guildsmen and townspeople generally understood each other (despite occasional disagreements) and worked collaboratively. Guilds were not backward, overly conservative, or behind the times. They found ways to work in harmony with the overall environment that provided their living and adapted to changing circumstances.

Apprentice and Journeyman often travelled to numerous cities during their training to learn a craft. This resulted in lots of men on the move which drove the need for Herbergs (lodging houses). Refer to Figure 3 for a brief discussion of Herbergs and insights into the structure, and operation, of a typical German Guild during this period of history.

This centralized labor pool allowed the Guild to meet the fluctuating labor demands of the craft. The Berg & Mark coin scales were produced in a semi-industrial method of assembling pre-fabricated parts such as wood boxes, weights, equal-arm beam scales, etc. from the various Guilds. This ensured a reduction in cost and enabled wide-scale commercial success across Europe.

Fabrication of the Wood Boxes

It was the custom, since Byzantine times, to keep these sensitive scales, and associated small weights, in specially fabricated wood boxes as a means of protecting them from damage or loss, and facilitating their transportation. These boxes were rarely made of metal and were small enough to be carried in a pocket to always be with the Merchant.

A special Guild of craftsmen assumed the right to make these little boxes (Laden). The boxes were typically made of fine-grained wood. Each case was meticulously crafted from a single piece of wood for the lid and tray. Since the coin weights were cubes with all four edges tapering inward, the socket for each weight was painstakingly tapered to a matching angle such that the coin weight fitted snugly into its socket. Additionally, there was a separate lidded compartment for the "azen" (grain-weights) used to determine the difference from ideal weight when a coin was too light, and the buyer had to pay one or two extra copper coins. The wood boxes were typically stained a blackish-brown color. In this case, the "Birdseye" embellished hook design indicates the coin scale set was made by J. P. Aeckersberg.

Information Contained in the Wood Boxes

These little boxes represent a snapshot-in-time of history. Each box usually contained:

- A Master-sign label indicating the maker's name, city of his workshop, statements of Royal permission and historical prestige, and the year of manufacture. See Figure 5.
- Indication if the scale-maker was also a certified adjuster of weights as indicated by JUSTIRT burned into the lid. See Figure 5.
- Handwritten red ink defining the location of each weight in the tray. See Figure 7.
- Sometimes displayed the Master-sign of the balance maker as well as JUSTIRT, a verification mark applied by the inspector.

All of this was prescribed by law and the Constitutions of the respective Guilds involved in making a coin scale set. Many times the boxes contained family names of previous owners through the years.

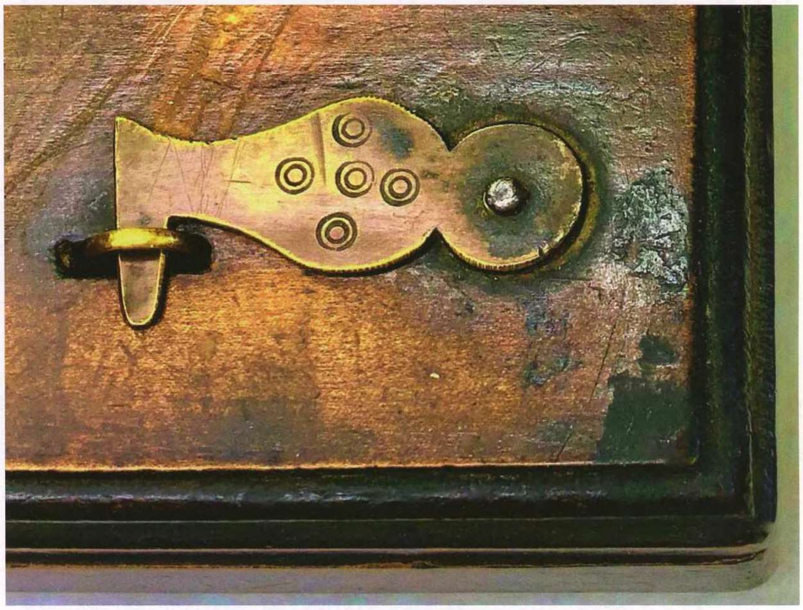


Figure 4. ⋀⋀ Close-up view of brass 'birdseye' embellished hooks and loops protruding through the box lid. Coin scales from Berg & Mark always had nicely finished edges on the top of the case as can be seen in this figure. These boxes represented the fine precise woodworking craftsmanship of the day.

Note: Each scale-maker utilized different decorative designs on their brass hooks. Hence it is possible to identify the coin scale maker without opening the box to see the trade label.

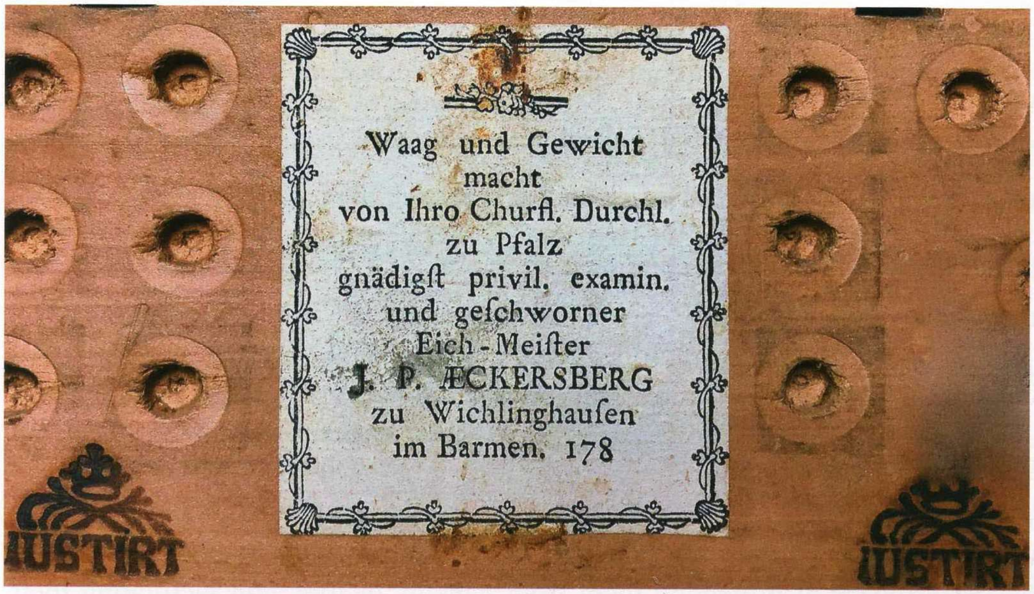
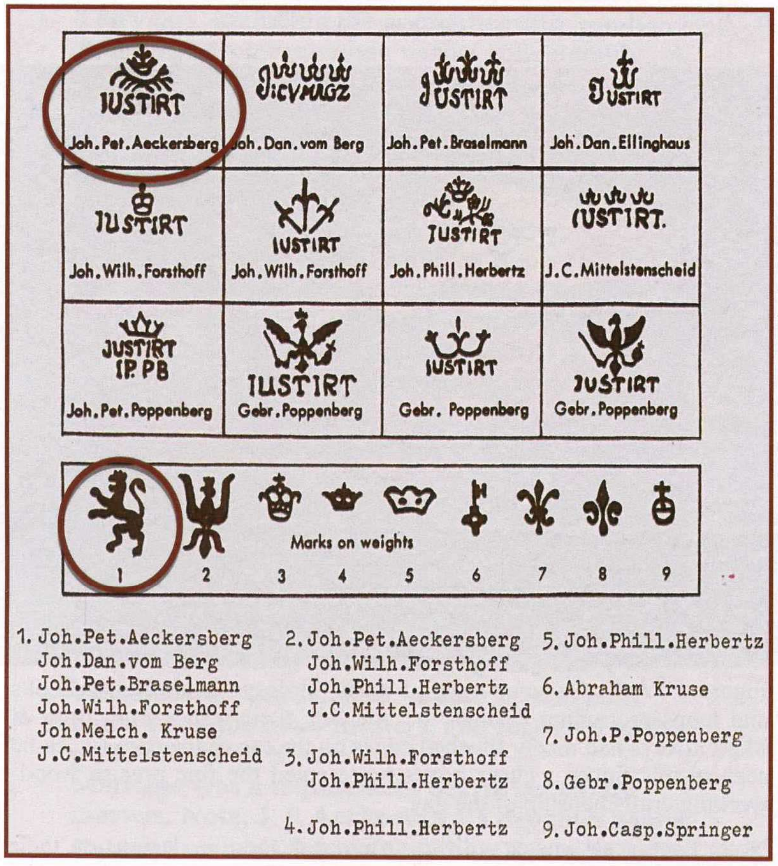

Waag und Gewicht
macht
von Ihro Churfl. Durchl.
zu Pfalz
gnädigſt privil. examin.
und geſchworner
Eich-Meiſter
J. P. ÆCKERSBERG
zu Wichlinghauſen
im Barmen. 178

Figure 5. ≺≺ Aeckersberg's label with typical floral braid around edges, and JUSTIRT (Just or Accurate) burned into wood box lid. It is interesting to note J. P. Aeckersberg utilized more than 36 different labels in his boxes over his roughly 40-year career amounting to many thousands of scale sets produced!

The Master-sign label translates as: "Scales and Weights made by [permission of] His Serene Highness, Elector of the Palatinate, graciously privileged, examined and sworn Inspector of Scales and Weights J. P. AECKERSBERG of Wichlinghausen in Barmen, 178___." The paper label contains the German word "Eichmeister" which means Inspector, Calibrator, or Verifier of Scales and Weights. It was an honor to be the Eich-meister, as it means he was trusted by the townspeople.

My set was clearly made by Johann Peter Aeckersberg in Wichlinghausen between 1780 and 1790 making it one of the last sets he ever made! Coin scale makers of this region typically printed quantities of paper labels, and made a hand-written note for the specific year the set was produced. In this example, and in many other Berg & Mark examples the scale-maker never completed this dating detail.



IUSTIRT Joh.Pet.Aeckersberg	ICVMAGZ Joh.Dan.vom Berg	IUSTIRT Joh.Pet.Braselmann	IUSTIRT Joh'.Dan.Ellinghaus
IUSTIRT Joh.Wilh.Forsthoff	IUSTIRT Joh.Wilh.Forsthoff	IUSTIRT Joh.Phill.Herbertz	IUSTIRT. J.C.Mittelstenscheid
JUSTIRT IP.PB Joh.Pet.Poppenberg	IUSTIRT Gebr.Poppenberg	IUSTIRT Gebr. Poppenberg	JUSTIRT Gebr.Poppenberg

Marks on weights
1
2
3
4
5
6
7
8
9

1. Joh.Pet.Aeckersberg
 Joh.Dan.vom Berg
 Joh.Pet.Braselmann
 Joh.Wilh.Forsthoff
 Joh.Melch. Kruse
 J.C.Mittelstenscheid

2. Joh.Pet.Aeckersberg
 Joh.Wilh.Forsthoff
 Joh.Phill.Herbertz
 J.C.Mittelstenscheid

3. Joh.Wilh.Forsthoff
 Joh.Phill.Herbertz

4. Joh.Phill.Herbertz

5. Joh.Phill.Herbertz

6. Abraham Kruse

7. Joh.P.Poppenberg

8. Gebr.Poppenberg

9. Joh.Casp.Springer

Figure 6. ≺≺ J. P. Aeckersberg Senior and Junior Maker's Marks; noted by circles on table. Table from EQM, Page 64, drawings by Carl Mönnig. Table also shows maker's marks from other notable coin scale makers illustrated in Figure 11.

Coin Weights

In my set, shown in Figure 7, each weight is labeled for the coin it represents and bears Aeckersberg's mark, the Palatinate Lion.

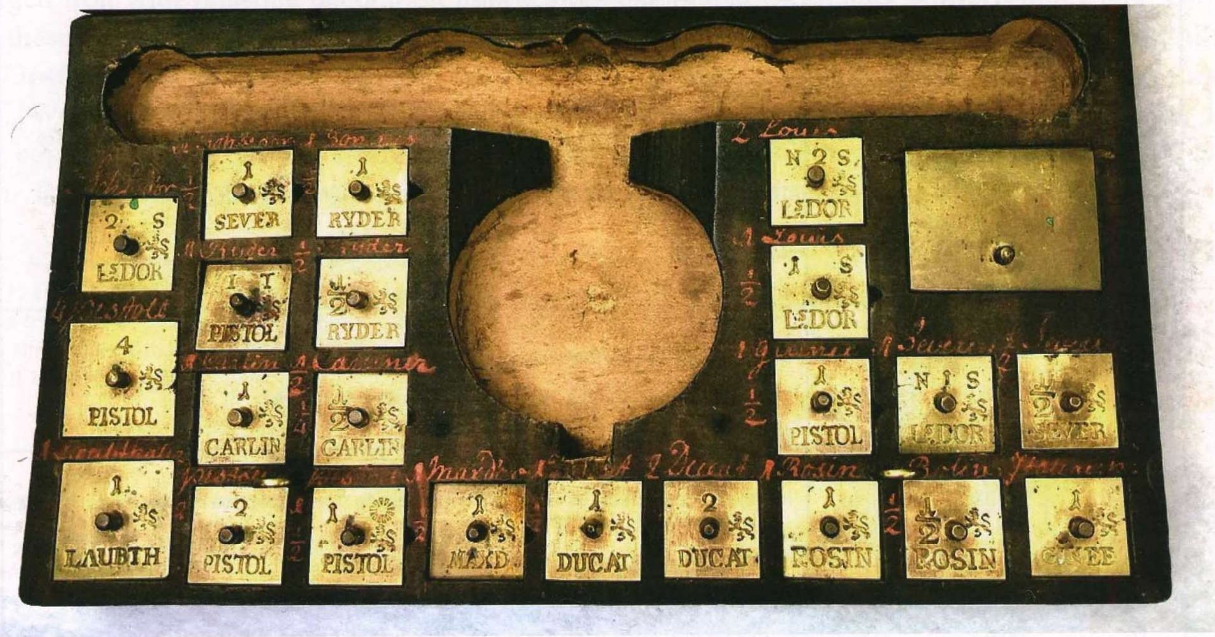


Figure 7. ⩓⩓ My coin weights in their box. Note hand written coin names in red ink by each recess in the tray.

This set contains 22 knobbed weights, an additional 5 quarter, or half, weights stored under the unit weight in an extra deep socket, and three grain weights (also known as: Azen, As, Asse, Gran, or Blattgran) in the brass-lidded locker. Refer to Figure 9 for a complete inventory of the weights in this set. Each weight is labeled with the gold or silver coin it represents.

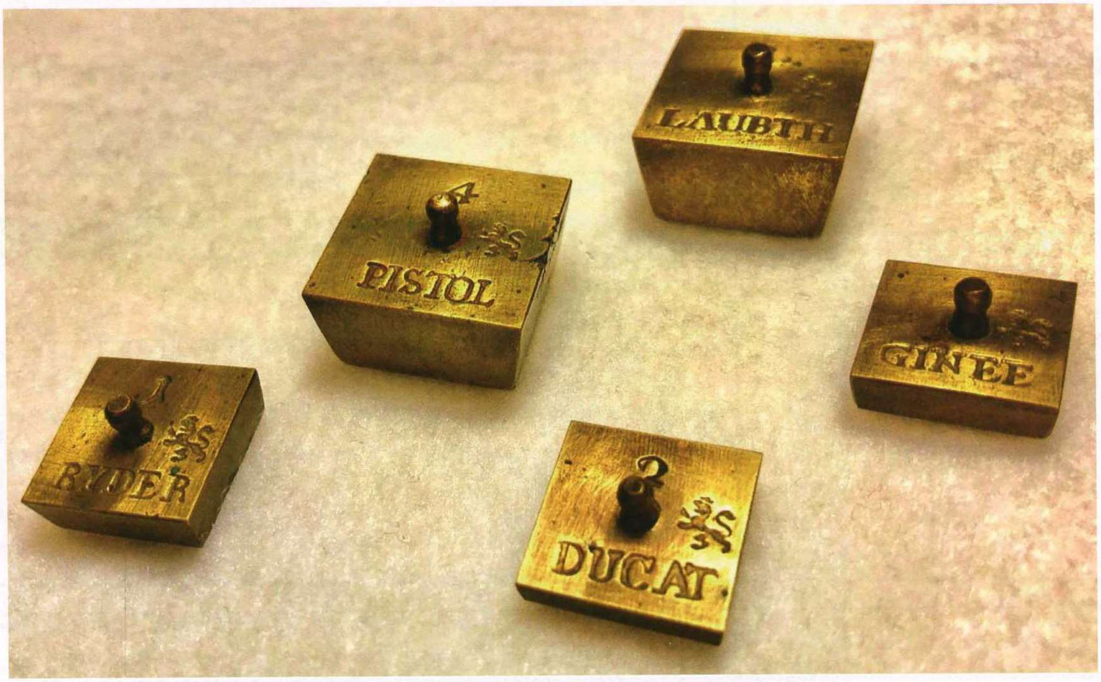


Figure 8. ⩓⩓ Close-up of a few weights showing J. P. Aeckersberg's Palatinate Lion mark. The weights were square, knobbed, and had tapered sides to clearly distinguish them from the coins they represented.

Figure 9. ⮟⮟ Inventory and historical notes for weights in this J. P. Aeckersberg coin scale.

Weights in Set	Denomination	Historical Notes
Louis d'or	Have 6 weights marked: 1 S, 2 S, N1 S, N2 S NS ½ ½ L d'or is Un-Knobbed	Louis d'or denotes French coins first introduced by Louis XIII in 1640 Dor is French, d'or meaning "of gold" Portrait of King Louis on one side; French royal coat of arms on reverse side Coin was replaced by French franc after the revolution and later the similarly valued Napoleon Actual value of the coins fluctuated according to monetary and fiscal policy, but in 1726 the value was stabilized 1640 issue of Louis d'or contained five denominations: a half Louis and a one, two, four, and eight Louis All subsequent issues through 1793 were only denominated in ½, 1, & 2 Louis 1 Louis d'or - Normal Weight: 8.1584g; Fine Gold: 7.478g
Laubth	1	Introduced in 1845 and known as a Laubtaler "taler" is original word for dollar French silver coin, the ecu aux lauriers, ecu with laurel leaves Normal Weight: 29g
Pistol **(Pistole)**	1 (Qty = 2), 2 (Qty = 2), 4	Pistole - French name given to a Spanish gold coin from 1537 It is also German name for Spanish Double Escudo struck since that became the pattern for the French Louis d'or Also known as Dublon(e), Dublone, or Doppia Found mainly in scales from the Berg and Mark area of Germany Name was also given to the Louis d'Or of Louis XIII of France, and to other European gold coins of about the value of the Spanish coin The coin appears repeatedly in Dumas' fiction from the 1620s Was widely used in England from about 1680 – 1720, and numerous English weights for the Pistole are known 1 Pistol - Normal Weight: 6.7g; Fine Gold: 6.2g
Sever **(Severin)** **(Sovrano)**	½, 1	German name, Souveraindor, circulated in Roman & German Empire Introduced in 1612 in Austrian Netherlands 1 Sever - Normal Weight: 5.5564g; Fine Gold: 5.0982g
Ryder	½, 1	Coin was produced in several of the "Low Countries" (Belgium, Holland, etc.) in 1670s in several varieties – all with similar weights ~10g for a 1 Ryder coin Design shows a mounted horseman
Carlin **(Carolin)**	½, 1	Struck in 1726 by the Bavarian elector Karl Albrecht (1726 – 1745) based on the French Louis d'or 1 Carlin - Normal Weight: 9.735g; Fine Gold: 7.504g
Ginee	1	English Guinea produced from about 1661 until 1816 1 Guinea – Normal Weight: 8.05g
Maxdor	1	Gold coin struck in 1715 by Bavarian Elector Maximilian Emanuel (1679-1726) Replaced by the Carolin in 1726 1 Maxdor - Normal Weight: 6.4986g; Fine Gold: 5.0093g
Ducat **(Dukat)**	½, 1, 2 ½ Ducat is Un-Knobbed	Medieval gold or Silver coin widely circulated in Holland, Russia, Austria, and Sweden, and means "Duke's Coin" Was raised to be main gold coin of the German Reich by Ferdinand I (1556-1564) Any gold coin weighing about 3.5g could have been known by this name since there was a profusion of ducats in circulation that were made in numerous locations Trade coin used in Europe from 1824 (first issue of the gold Ducat in Venice under doge John Dandolo) until 1919
Rosin	½, 1	An ancient English gold coin with the image of a rose
3 Unmarked Grain Weights	Also known as: Azen, As, Asse, Gran, or Blattgran	Weights used to determine when a coin was too light and the payee had to pay one or two pennies extra in the transaction at hand

Table Definitions: (1) Normal Weight: Weight of a gold or silver coin as minted, (2) Passing Weight (Least Common Weight, LCW): Weight deemed acceptable for a well-used gold coin in circulation, (3) Fine Gold: Weight of gold in the coin. Comparing fine gold and actual weight gives an indication of the percentage and quality of gold used in the coin.

Scale Beam, Cords, and Pans

The hand-held equal-arm beam has a German swan-neck end design, #13 in Diana Crawforth-Hitchins' chart on page 2573 in EQM. This design was particularly used in Nuremberg, Germany. The beam is made of hand-forged iron with fine-line decoration mid-beam. The pointer is slender with a small round knob at the tip. All these details are very typical design elements of the famous German scale maker Johann Phillip Herbertz (1736-1778). Johann Philip Herbertz, and his father (of the same name), were both coin scale-makers in this area. We know nothing about J. P. Aeckersberg's life and training before 1747. Since his beam design is an exact copy of J. P. Herbertz's design, it is possible he received his training from J. P. Herbertz Senior in Solingen. Remember, Solingen was only 12 miles from Wichlinghausen, a very real possibility.

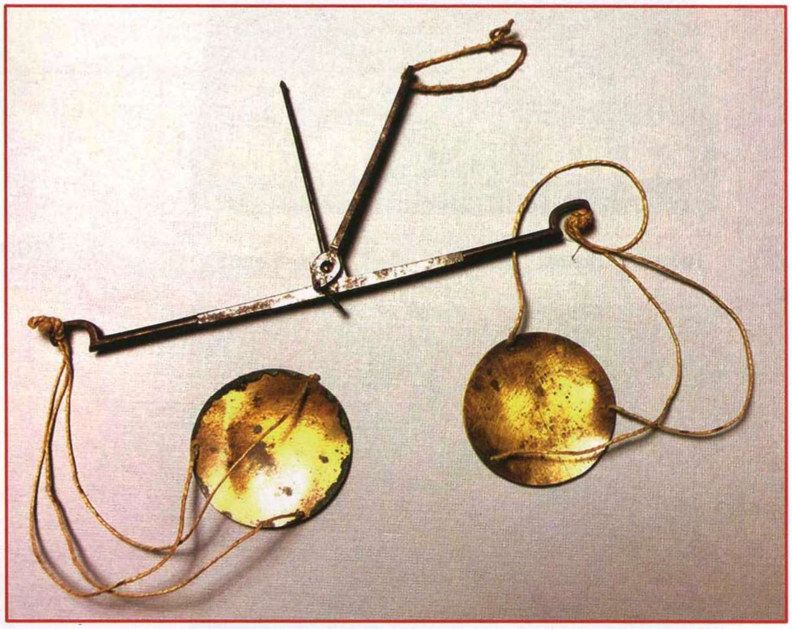
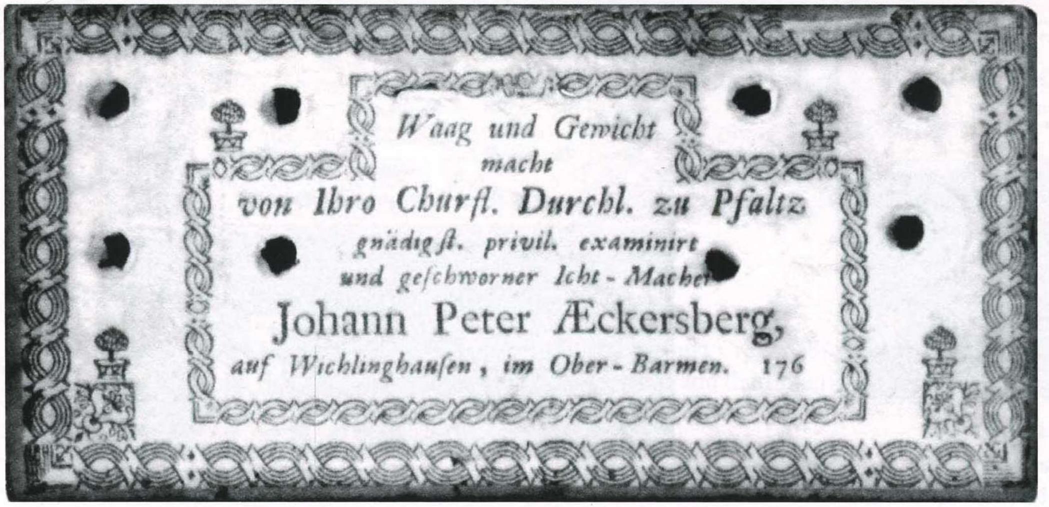


Figure 10. ➢➢ Scale beam and shallow concave pans from my J. P. Aeckersberg coin scale showing many similarities to those of J. P. Herbertz Senior. The scale pans have no maker's mark or embossed design which is typical of this time period.

There have been three or four cords, as opposed to chains, connecting the pans to the beam since ancient times. The government of Cologne prescribed the use of silk cords to prevent changes in weight due to hydroscopic absorption of water from the air, or any fraudulent manipulations by wetting the cords. The cords on other European coin scales were almost always green (easier on the eyes), but were occasionally black or white. This scale has the original white cords, and is an example of the rare use of white cords. All examined examples of J. P. Aeckersberg's coin scales have white silk cords identical to this example. The reason why is lost to history.

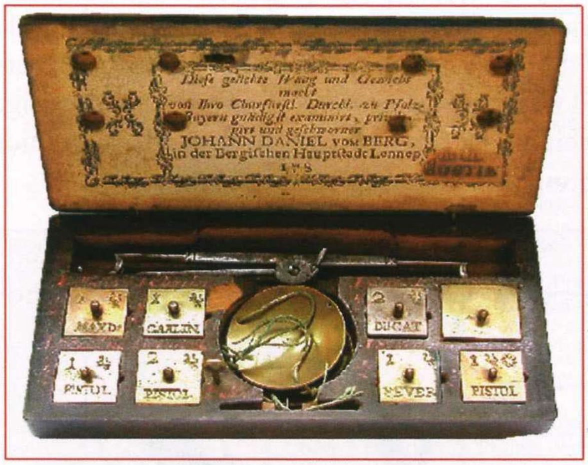


Waag und Gewicht
macht
von Ihro Churſl. Durchl. zu Pfaltz
gnädigſt. privil. examinirt
und geſchworner Icht - Macher
Johann Peter Æckersberg,
auf Wichlinghauſen, im Ober - Barmen. 176

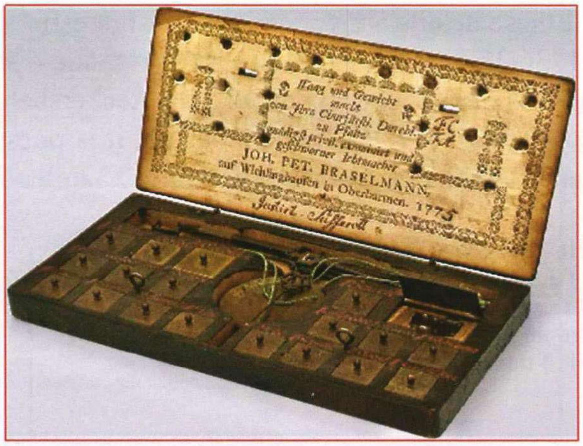
Figure 10A. ≺≺ One of seven boxes by J. P. Aeckersberg shown by Guido in his book *The Zavattoni Collection, Part 4*. Note the earlier spelling of Eich-Meister as Icht Macker.

Figure 11 illustrates German coin scales from other notable makers from the Berg & Mark area during this period of time along with some interesting notes on relationships with each other.

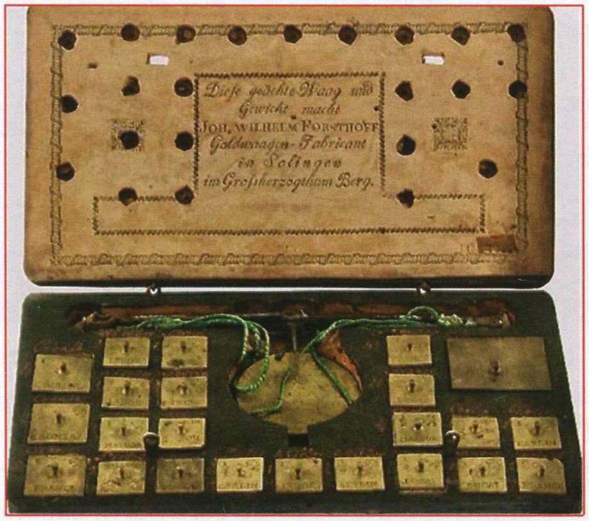
Figure 11. ⋎⋎ Notable Berg and Mark makers. Characteristics observed in each example: wood boxes, knobbed square weights, weights marked for coin, red hand-written notation for each weight, iron beam and pointer, round brass pans, and paper labels.



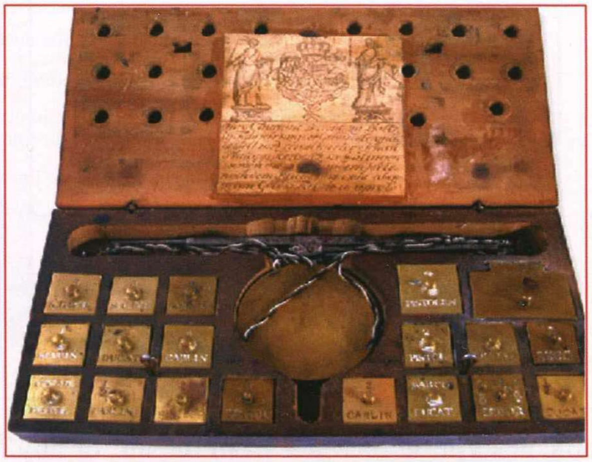
Johann Daniel von Berg, 1733-1804, Lennep



Johann Peter Braselmann, 1770-1837, Wichlinghausen

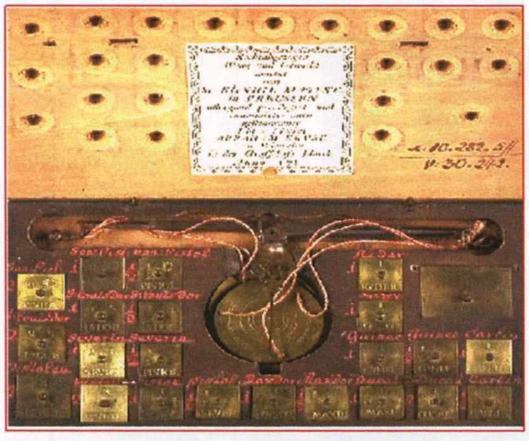


Johann Wilhelm Forsthoff, 1760-1803, Solingen



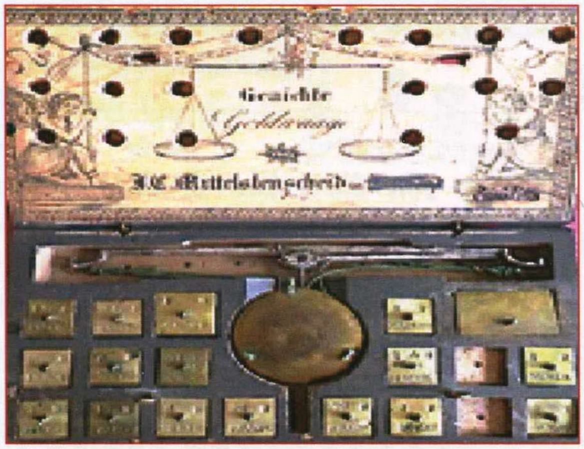
Johann Philipp Herbertz Sr., 1699-1770, Solingen

- Three scale making sons: Johann Abraham, Johann Wilhelm, & Johann Philipp Jr.
- Daughter married brother of J. Wilhelm Forsthoff
- J. Wilhelm, London, 1760 & still active in 1779



Abraham Kruse, 1745-1814, Schwelm

- Moved business to Schwelm in 1772
- Encouraged Poppenberg to enter coin scale business



Johann Casper Mittelstenscheid, 1764-1819, Lennep

- Learned craft from his uncle J. P. Braselmann
- Son Peter Casper continued the business 1803-1868

This coin scale is an excellent example of transacting business in Europe during the late 18th Century since the majority of these scales were exported from Germany to many major trading centers across Europe. It is also a snapshot-in-time showing examples of handwriting, coin names in circulation at that time with their spelling, and how Masters identified and advertised themselves via their Master-sign labels. Most importantly, J. P. Aeckersberg was granted the initial permission to make these scales in the Berg & Mark region, and he single-handedly established the now familiar characteristics of these scales for all other makers located in the 25 miles surrounding his workshop.

It is interesting this coin scale set never left Germany in 200 years of use! This scale was passed from generation-to-generation until the last person to inherit the set was the elderly German lady who sold it to my friend in 1980. I bought the set from him in 2017 in Michigan. If this scale could talk, for sure, it would be an interesting story!

Notes

1. Some sources state J. P. Aeckersberg (also spelled Ackersberg) began producing coin scales in 1749, and other sources state his business began in 1754.
2. Electrum, both naturally occurring or artificial alloy of gold, contains at least 20% silver, which was used to make the first known coins in the Western world. Natural electrum contains trace amounts of copper, iron, palladium, bismuth, and other metals.

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Acknowledgments

The author would like to express his appreciation to Diana Crawforth-Hitchins, Fred Rengel, Norman Biggs, Robert Jibben, and Helmut Schmidt for their review of this article, and their many valuable contributions.

Another Early Multi-Coin English Balance Maker - Jesse Ramsden

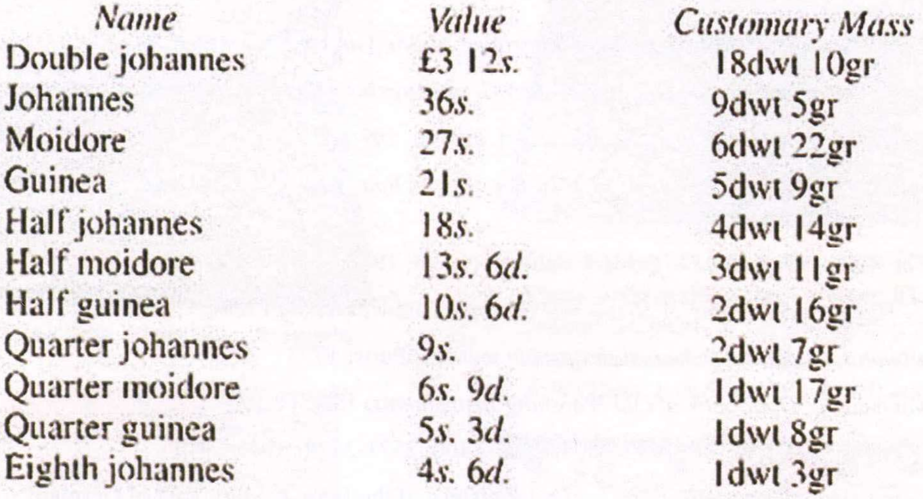
BY MICHAEL FOSTER

Jesse Ramsden, Mathematical, Optical and Philosophical Instrument maker working in London from 1762 to 1800 was another early Multi-Coin English Balance maker. Ramsden's solution to eliminating the need for the "Long Set" of weights resulted in a folding coin balance design utilizing a sliding poise weight with a 'missing value' slide on top of the poise.

Portuguese gold was in general circulation in addition to British Mint gold coinage (the Guinea and its fractions) officially up to the Great Recoinage Law of 1816. This was because of the large amount of trade with Portugal after England's trade treaty in 1703 and the customary acceptance of Portuguese gold coin (the Johannes and Moidore and their fractions) in payment. Portuguese gold more or less disappeared after about 1780 when there were sufficient newly minted guineas in circulation.

After 1762 with the introduction of the quarter guinea, there were eleven gold coins for which weights were conventionally supplied. Collectors today refer to the weights as a "Long Set". The mass stated in Table 1 from Norman Biggs', *Provincial Coin Weights in the Eighteenth Century*, is the one most frequently given, but there was no official standard for most of the Portuguese pieces.

Table 1. Mass of British and Portuguese gold coins



Name	*Value*	*Customary Mass*
Double johannes	£3 12*s.*	18dwt 10gr
Johannes	36*s.*	9dwt 5gr
Moidore	27*s.*	6dwt 22gr
Guinea	21*s.*	5dwt 9gr
Half johannes	18*s.*	4dwt 14gr
Half moidore	13*s.* 6*d.*	3dwt 11gr
Half guinea	10*s.* 6*d.*	2dwt 16gr
Quarter johannes	9*s.*	2dwt 7gr
Quarter moidore	6*s.* 9*d.*	1dwt 17gr
Quarter guinea	5*s.* 3*d.*	1dwt 8gr
Eighth johannes	4*s.* 6*d.*	1dwt 3gr

As Portuguese and English gold coins, in circulation, started to show wear and were often clipped, the need for the "Long Set" of coin weights or some other means to test gold coins became apparent.

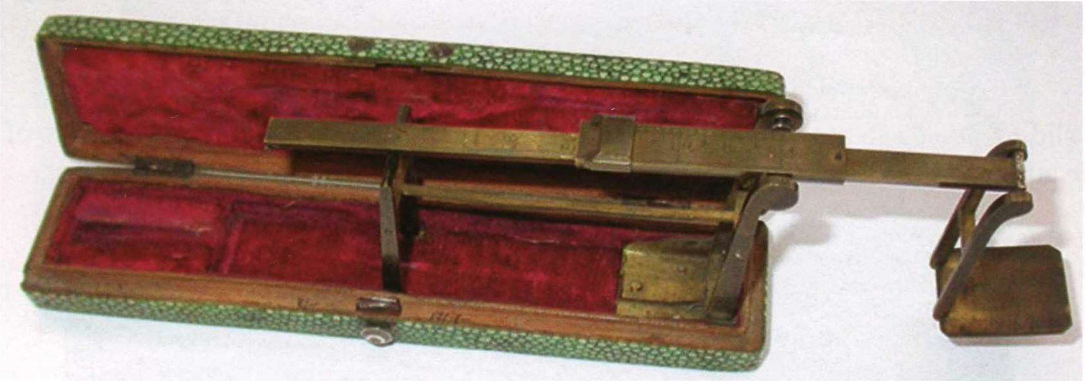
Small folding coin balances were carried by merchants, tradesmen and gentlemen to check the weight of the domestic and foreign coins that passed through their hands.

Four major types of folding gold balances were available: the equal-arm, adapted from traditional balances into the folding type that required loose coin weights; the unequal-arm with a sliding poise, adapted from the steelyard, accommodating a wide range of coins without the inconvenience of loose weights; the single turn-poise, in which a hinged poise moved from one position to another, for weighing the guinea and half-guinea, and in 1798 the double turn-poise type which could weigh a third guinea fraction, the seven-shilling piece.

A London based inventor and mathematical, optical and astronomical instrument maker, Jesse Ramsden, designed a multi-coin folding unequal-arm balance using a rare sliding poise on a beam graduated for 10 coins, the Johannes, Moidore, Guinea and their subdivisions from 36s down to 4s 6d.

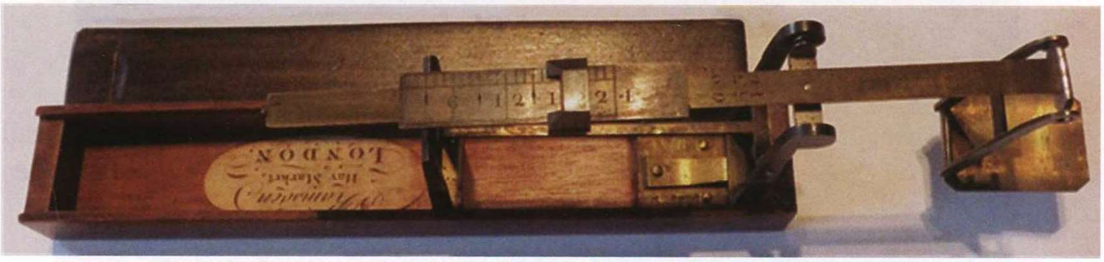
Ramsden's invention added onto the sliding poise a novel subsidiary 'missing value' or penny slide graduated 0-24 to measure deficiencies in pence from the Customary Mass. Two pence was a one grain deficiency in Customary Mass.

Jesse Ramsden's balance, described by Michael A. Crawforth in his book on English folding gold balances, *Weighing Coins*, shows Variant 1 illustrated below in his Figure 22 on p.57:



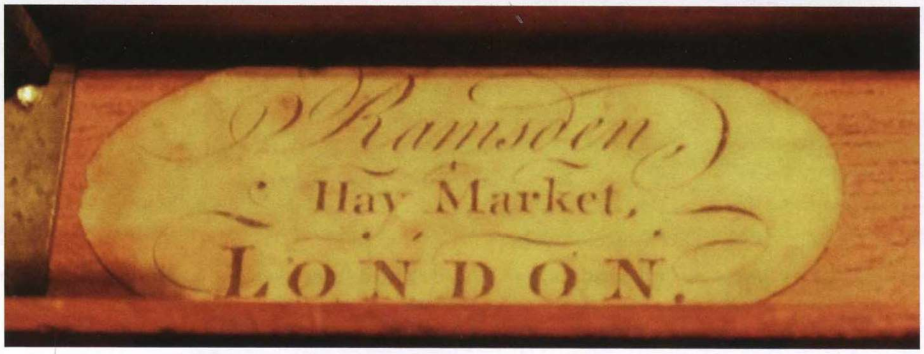
Variant 1: Jesse Ramsden folding gold 10-coin balance in shagreen covered side hinged box

A second example of the 10-coin, Variant 1a this time in a mahogany box:



Variant 1a: Folding gold 10-coin balance in mahogany slide top box with label

With a label that reads: "J. Ramsden, / Hay Market, / LONDON". This label dates to c.1770-73.

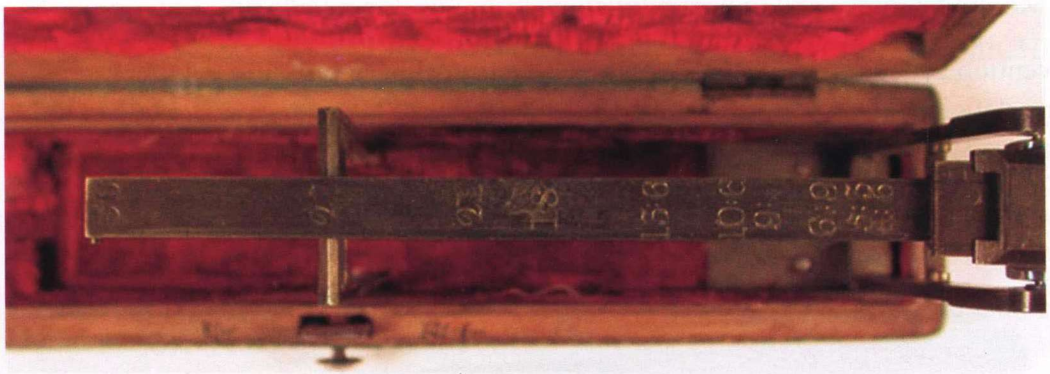


Ramsden,
Hay Market,
LONDON.

J. Ramsden label from Hay Market address, c.1770-73

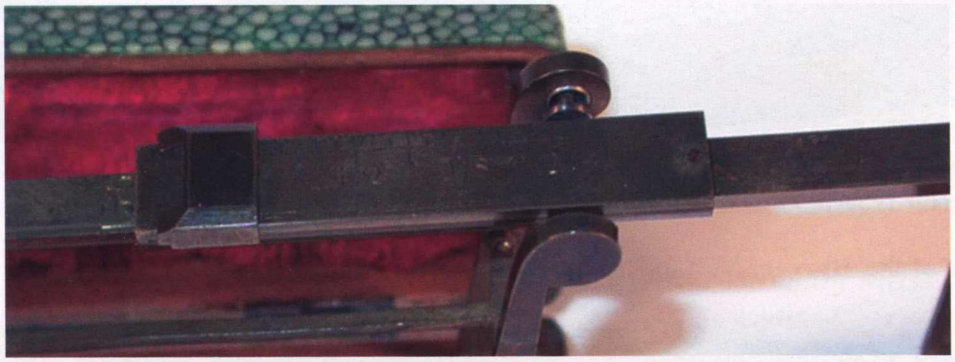
The Ramsden sliding poise with 'missing value' penny slide design was unusual in a market where loose coin weights or a single-turn poise were more common. It worked because of the precision that Ramsden brought to his manufacturing, which made accurate weight checking possible.

The beam of these folding balances has stops underneath to set the sliding poise for the 10 coins that can be tested from 36 to 4:6 shillings:



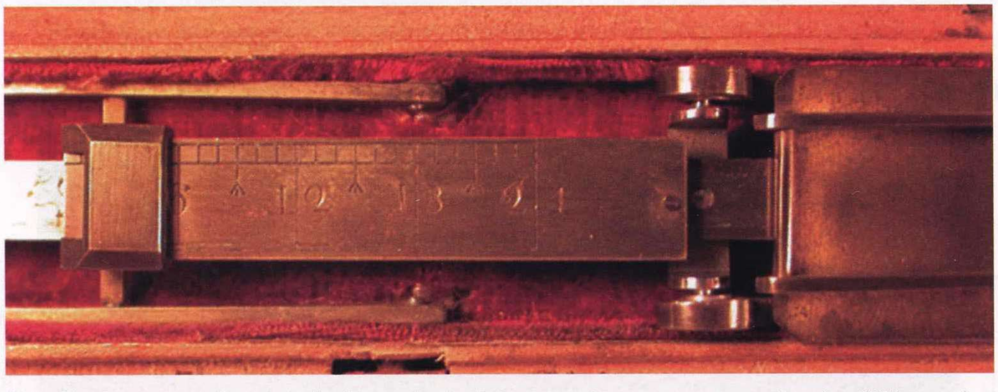
Detail of beam graduated for 10 coins from 36 to 4:6 shillings

Note that the sliding poise can move across the fulcrum without hinderance due to a new style of pivot mechanism and slide attachment to the beam used by Ramsden:



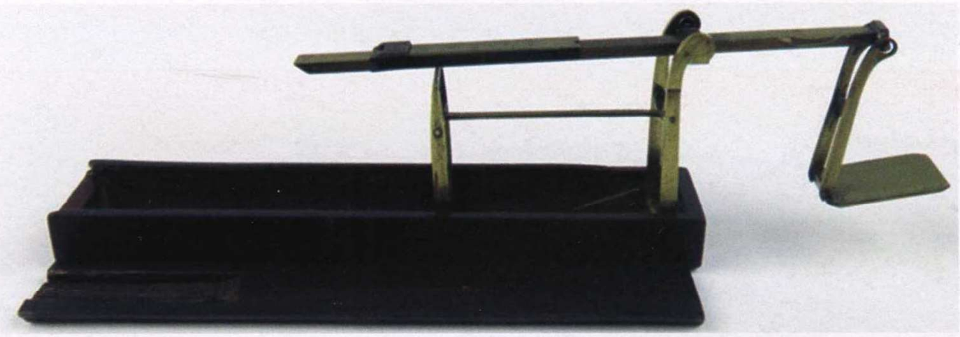
Detail of sliding poise weight on beam set for 13:6 with part beyond the fulcrum

After setting the sliding poise for the correct coin to be tested, put the coin on the plate. The small penny poise can be moved along the top of the main poise until the plate tips slightly. The penny poise graduated from 0-24 determines any missing value in pence from the Customary Mass:

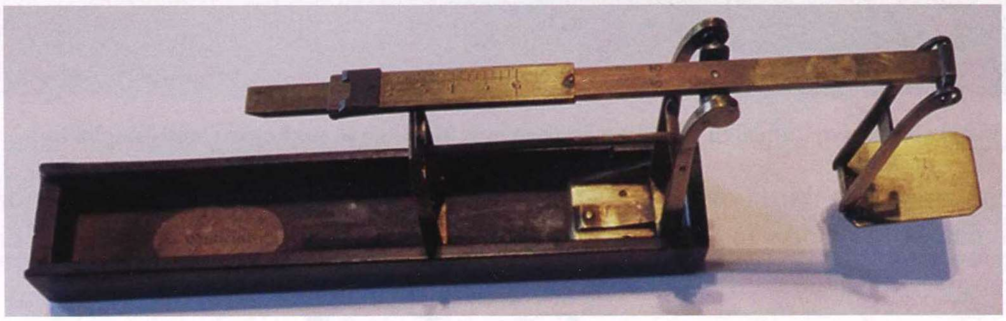


Detail of penny poise or 'missing value' slide set at 0 pence on top of main sliding poise

Some time after his move to Picaddilly c.1773, Ramsden introduced a second multi-coin sliding poise on a beam balance graduated for just 3 coins, the Guinea 21s, Half-guinea 10s 6d and Quarter-guinea 5s 3d. Variant 2 shown here from the Brian Brass collection, Lot 174 sold at auction in 2013:

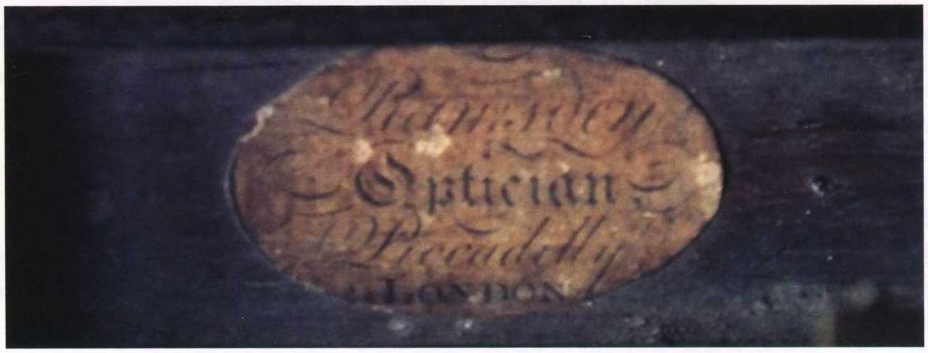


Variant 2: Jesse Ramsden folding gold balance in mahogany box with sliding top



Variant 2: Jesse Ramsden folding gold balance in mahogany slide top box with label

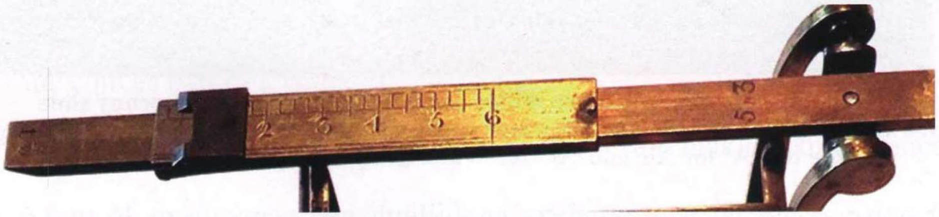
Variant 2 is found in a mahogany case with sliding wooden top and applied paper label, inscribed “J. Ramsden, / Optician, / Piccadilly, / LONDON’. This label dates to c.1773-78:



J. Ramsden label from Piccadilly address, c.1773-78

The beam of Variant 2 folding balances has stops underneath to set the sliding poise for the 3-coins that can be tested: 21s. 10s 6d and 5s 3d.

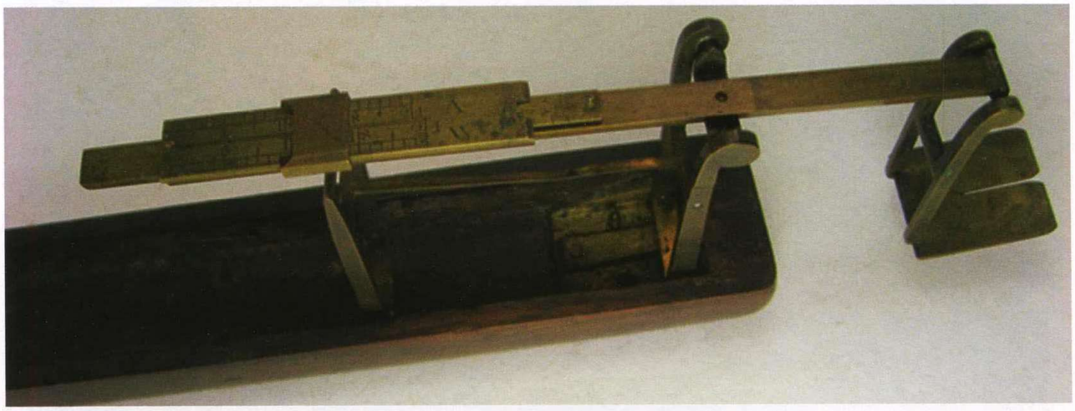
After setting the sliding poise for the correct coin to be tested, put the coin on the plate. The small penny poise can be moved along the top of the main poise until the plate tips slightly. This penny poise graduated from 0-6 determines any missing value in pence from the Customary Mass:



Detail of penny poise or ‘missing value’ slide set at 0 pence on top of main sliding poise

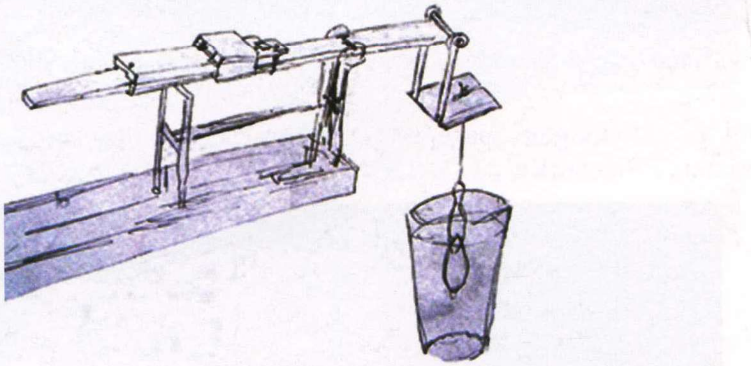
Beam graduation marks for 21 and 5.3 are also visible

Ramsden also made a third type of balance, Variant 3, signed 'Ramsden, Piccadilly', a hydrostatic coin-balance to detect counterfeits where the gold was adulterated with copper, thus weighing correctly in air but not in water:



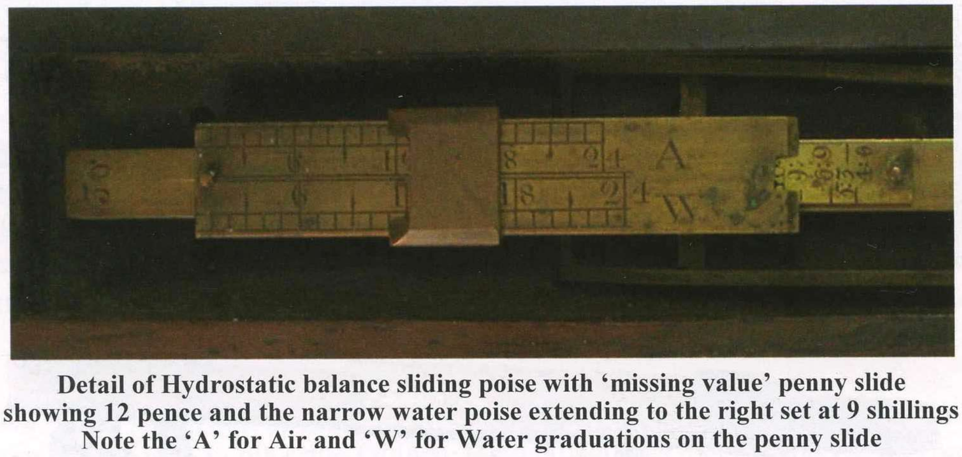
Variant 3: Jesse Ramsden's folding Hydrostatic Balance in mahogany end-hinged box

This balance is contained in a third type of box style, an end-hinged wood box. The slot evident in the plate is to take a horse hair with pincers to hold the coin during testing in water as shown in this drawing by Andrew Crawforth:



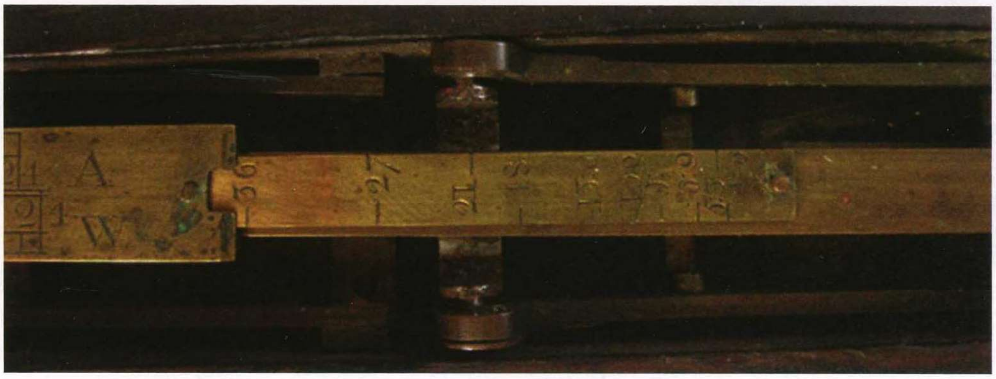
Hydrostatic Balance weighing coin in water

The main slide poise is set to the correct stop on the beam for the coin being tested in air and then the small penny poise slide, which is graduated for air 'A' measurements, is used to determine missing value if the coin has been adulterated:



Detail of Hydrostatic balance sliding poise with 'missing value' penny slide showing 12 pence and the narrow water poise extending to the right set at 9 shillings Note the 'A' for Air and 'W' for Water graduations on the penny slide

The narrow water poise, engraved with numbers in shillings and pence from 36 to 4.6, is sandwiched between the beam and the main poise. It is hidden by the main poise and moves with it while weighing in air.



Detail of the extended Water poise graduated for 10 coins from 36 to 4:6 shillings

When used for Water weighing it must be slid out to the right until its graduations indicate the same coin value as indicated on the beam.

Testing a coin using Ramsden's Folding balance is well described in a Serge Camilleri unpublished article: *A Hydrostatical Folding Gold Balance*:

> Firstly, *Pull the scales up from the box. The water poise is moved entirely under the main poise until it is hidden and the small penny poise is moved completely to the left end of the main poise. To weigh a 27s piece (a Moidore), move the main poise (and the water poise under it) over the beam until it reaches the notch 27. The 27s is put on the plate, If the coin is the correct weight, the plate tips. If it is not the full weight, move the penny pose to the right until the plate tilts down. Read the graduation on the 'A' air line over which the penny poise stops and that gives the deficiency in pennies lost. Assuming that the coin is made of gold only, the user knows the value of the coin.*

This operation is the same as with any folder equipped with a missing value slide. The weight of the coin may be right but the mass (or volume) may be greater because it contains some base metal of a lower density than gold that brought the weight up to the Customary Mass.

Then a second test (a volume test) is necessary with the coin immersed in water:

> *Put the pincers under the coin plate. Put the 27s in the pincers. Move the folder to the edge of the table so that the coin hangs freely over the side of the table. Move the main slide to its left, stopping at the notch 27 as before. Now, to counteract the buoyancy, move the water poise under main poise until the mark 27 is under the right-hand end of the main poise. Carefully raise a glass of water up to just cover the coin and the pincers with water. If the volume of the coin is correct, the coin and pincers remain totally under the water surface. If the volume is larger, then the excess buoyancy lifts the coin and the pincers at least partly out of the water, and a counterfeit has been identified. Put down the glass of water. Move the penny poise along the main poise. Raise the glass again. When the coin stays submerged, read the graduations indicated by the penny poise (the 'W' water line this time). For every two pennies indicated as lost, that is 1 grain indicated. For each grain lost when weighing in water deduct 3s 10½d from the value of the 27s.*

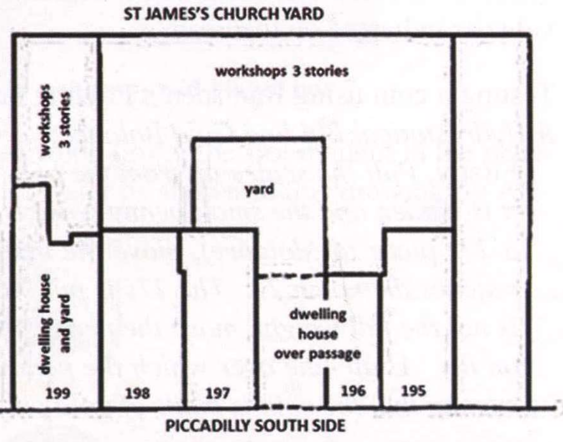
All things considered, this was a very time consuming process, which fell out of favour after 1774 with the Solomon Henry patent introducing gauge slots to quickly check the dimensions of a coin after weighing and hence the volume of the coin as part of a counterfeit detector.

Ultimately high demand for his other products obliged Ramsden to stop making coin balances by 1778.

Jesse Ramsden was born in Salterhebble, Halifax, Yorkshire on October 6, 1735. The son of an innkeeper, he was initially apprenticed to a cloth worker. The textile industry appears to have not interested him as at age 23 he apprenticed himself to a mathematical instrument maker Mark Burton in London. He proved himself a brilliant and skilful designer of instruments and in just four years by 1762, he had started his own business in The Haymarket, Westminster.

Ramsden married Sarah Dollond (1743-96) in 1766, the youngest daughter of John Dollond (1706-61) a maker of high quality lenses and optical instruments. They settled together in premises in The Haymarket. Sarah was no stranger to the workshop where she worked with the apprentices on some of Ramsden's projects. There is little known about their life together. Only one son John Ramsden (1768-1841) survived childhood. Sarah left Jesse in 1786 and went back to live with her brothers.

Ramsden moved his workshop and home in 1773 to 199 Piccadilly, and eventually acquired number 196 to expand his workshop. The layout of the 199 and 196 Piccadilly St. workshop and dwellings is included below.



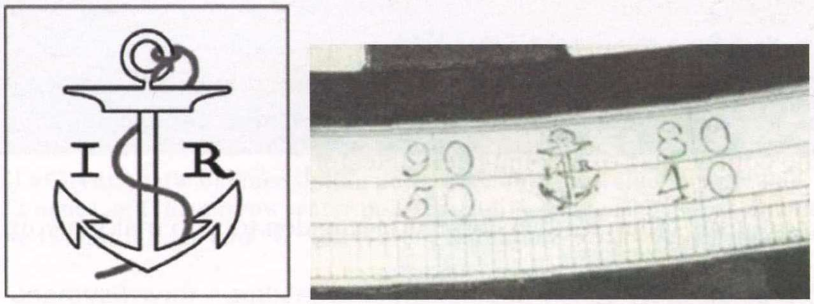
Dwelling house and Workshop Layout of 199 and 196 Piccadilly St.

Ramsden designed instruments of great accuracy, in part due to his invention of two dividing engines (one circular, one straight). The first in 1768 could graduate a scale accurately to one two-thousandth of an inch. This eliminated human error and made possible the division and inscription of graduations on instruments to be done with great precision and accuracy.

Ramsden, acknowledged as the best designer and manufacturer of mathematical, astronomical, surveying and navigational instruments of the time in England, required his workers to specialize in a single operation, and turned out a large quantity and range of scientific instruments.

His work force was said to be 40 to 50 men consisting of apprentices, journeymen and general workmen. Francois-Antoine Jecker, the French astronomical and optical instrument and coin-scale maker worked for Ramsden in 1786.

Ramsden had little time or need for patents and filed only one during his career. He usually used secrecy, contractual arrangements with the Board of Longitude, or his proprietor's mark (a foul anchor symbol flanked by his initials I and R) or just '**J Ramsden London**' or '**Ramsden** London' engraved on his instruments. Mostly he relied on his reputation.

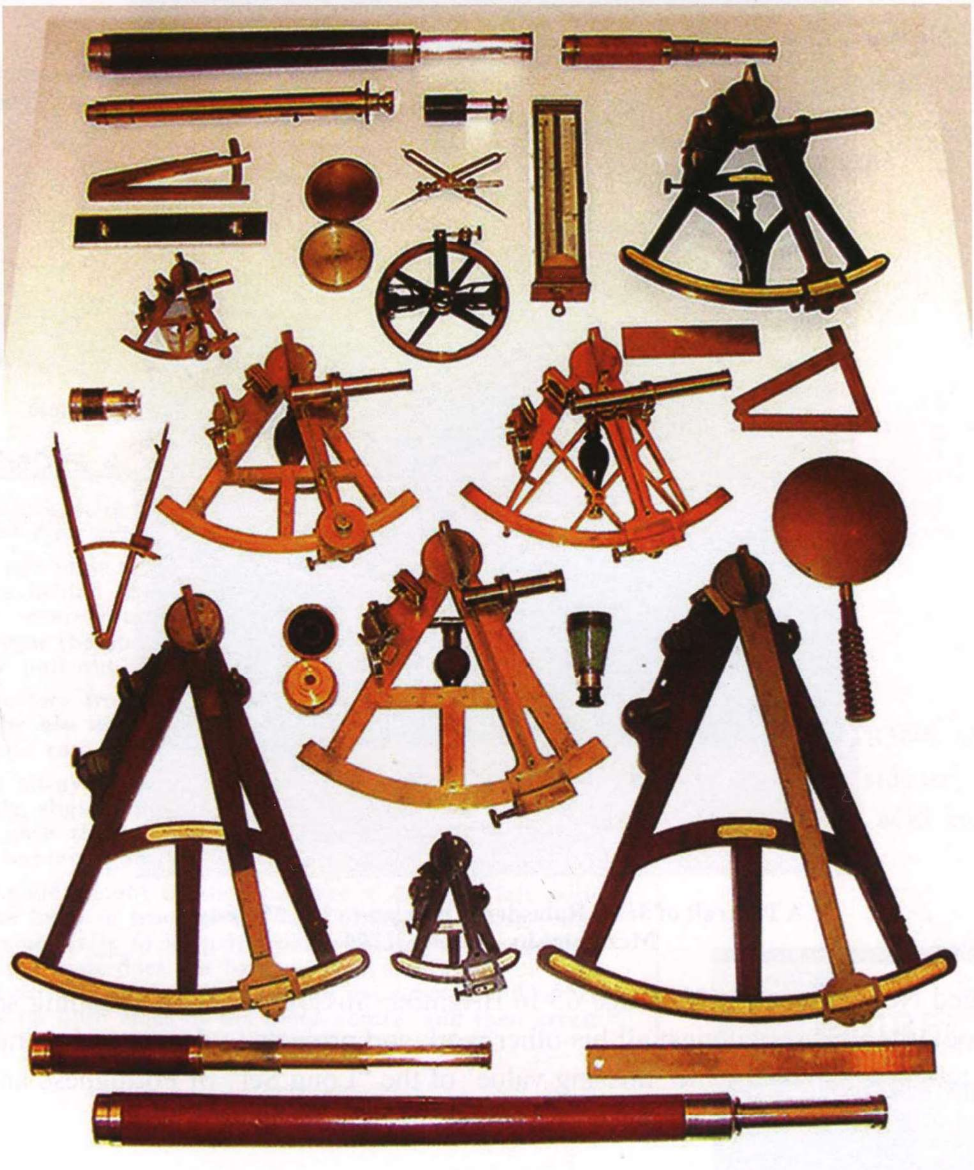


Ramsden's Proprietor Mark - Foul Anchor between initials I and R

JRamsden London

Ramsden London

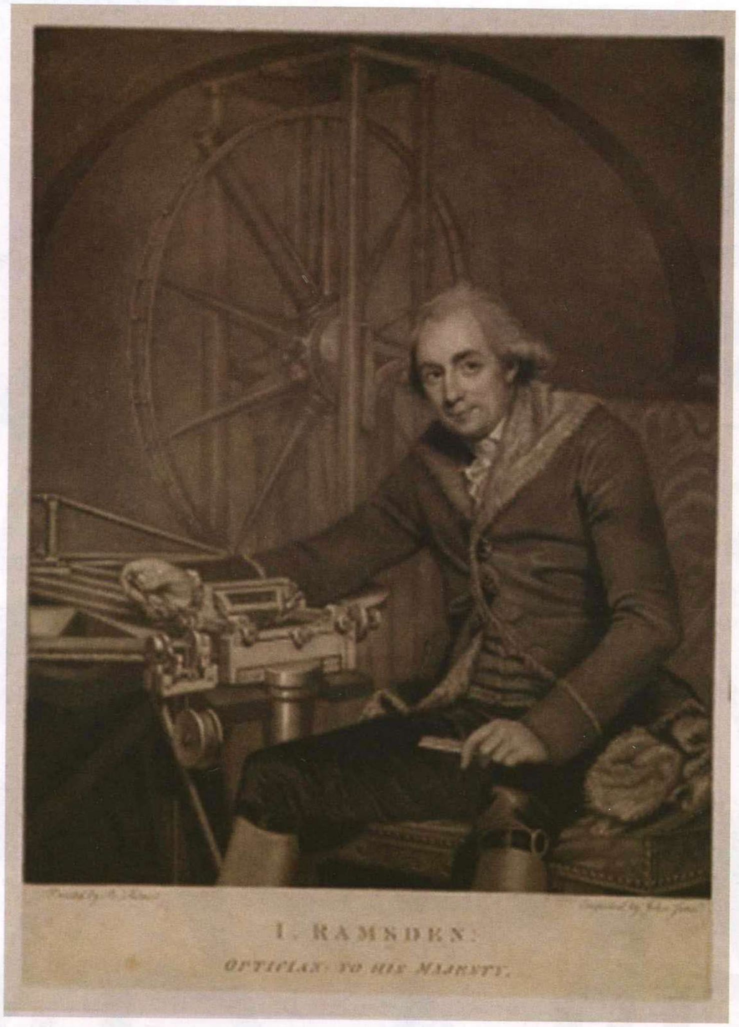
Examples of Ramsden's broad range of products:



Ramsden's Product Examples

Ramsden was infamous for missing deadlines. He drove clients and customers (like King George III) to distraction. Small wonder that, when he died, Dollond family executors could recoup only a tiny fraction of all the money owed him.

He was elected Fellow of the Royal Society (FRS) in 1786 and Fellow of the Royal Society of Edinburgh (FRSE) about 1798. In 1795 the Royal Society awarded Ramsden the Copley medal, for his inventions and improvements to philosophical instruments.



A Portrait of Jesse Ramsden, Optician to His Majesty
Mezzotint by J. Jones, 1790

Jesse Ramsden died November 5, 1800 at age 65 in Brighton, Sussex. London's leading scientific instrument maker, he took the time in amongst all his other work and projects to design and manufacture a folding gold balance to test and indicate the 'missing value' of the "Long Set" of Portuguese and English gold coinage.

Primary Reference

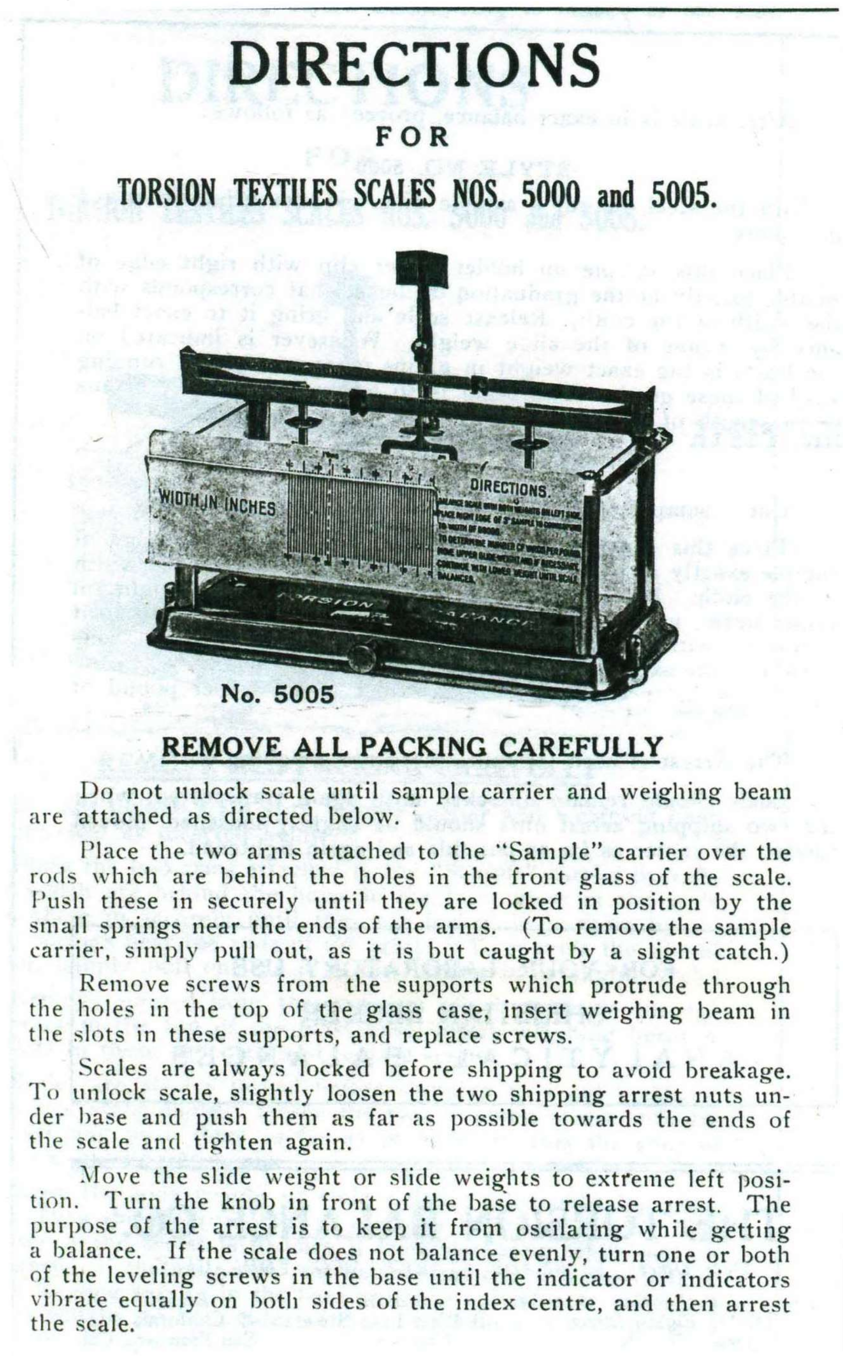
Anita McConnell, *Jesse Ramsden (1735-1800): London's Leading Scientific Instrument Maker*, Aldershot, UK: Ashgate, 2007, ISBN: 978-0-7546-6136-8

Acknowledgements

The author would like to thank Eric and Judy Soslau, Diana Crawforth-Hitchins, Mary Anne Murphy, Kurt Beyreis and the late Andrew Crawforth for their assistance in this article.

Showcase

The ISASC Museum houses a Torsion Balance Textile Scale with its original oak case which can be closed around the scale to prevent dust from getting on the balance when it is not in use.. It also has within its case an original set of directions for setting up and using the scale. A style 5005, it uses a 3" square fabric sample to determine the number of yards per pound of the sample.



DIRECTIONS

FOR

TORSION TEXTILES SCALES NOS. 5000 and 5005.

WIDTH IN INCHES
DIRECTIONS
TORSION
BALANCE

No. 5005

REMOVE ALL PACKING CAREFULLY

Do not unlock scale until sample carrier and weighing beam are attached as directed below.

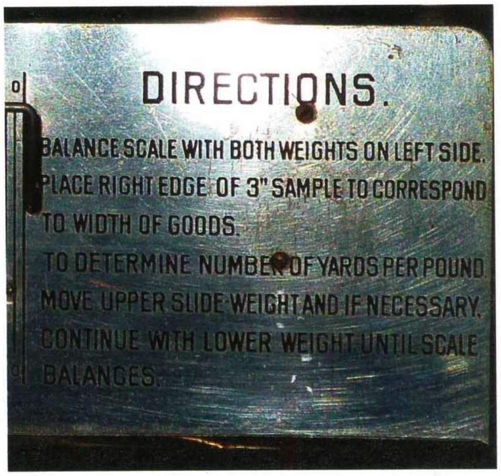
Place the two arms attached to the "Sample" carrier over the rods which are behind the holes in the front glass of the scale. Push these in securely until they are locked in position by the small springs near the ends of the arms. (To remove the sample carrier, simply pull out, as it is but caught by a slight catch.)

Remove screws from the supports which protrude through the holes in the top of the glass case, insert weighing beam in the slots in these supports, and replace screws.

Scales are always locked before shipping to avoid breakage. To unlock scale, slightly loosen the two shipping arrest nuts under base and push them as far as possible towards the ends of the scale and tighten again.

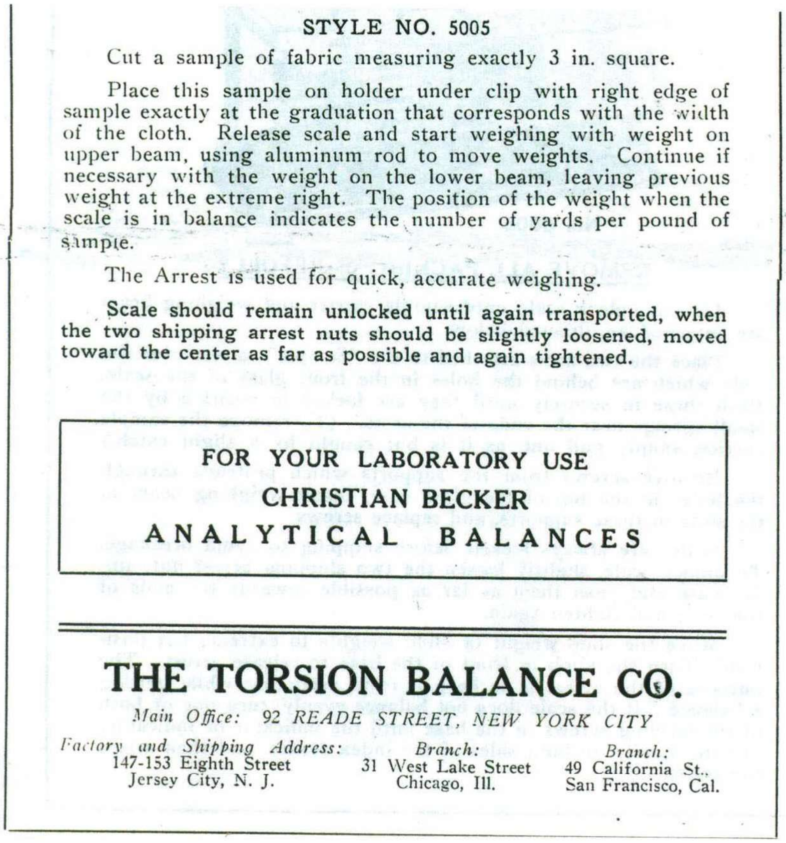
Move the slide weight or slide weights to extreme left position. Turn the knob in front of the base to release arrest. The purpose of the arrest is to keep it from oscilating while getting a balance. If the scale does not balance evenly, turn one or both of the leveling screws in the base until the indicator or indicators vibrate equally on both sides of the index centre, and then arrest the scale.

The DIRECTIONS shown below are on the right side of the chart of the scale and are acid etched into aluminum.



DIRECTIONS.

BALANCE SCALE WITH BOTH WEIGHTS ON LEFT SIDE.
PLACE RIGHT EDGE OF 3" SAMPLE TO CORRESPOND
TO WIDTH OF GOODS.
TO DETERMINE NUMBER OF YARDS PER POUND
MOVE UPPER SLIDE WEIGHT AND IF NECESSARY,
CONTINUE WITH LOWER WEIGHT UNTIL SCALE
BALANCES.



STYLE NO. 5005

Cut a sample of fabric measuring exactly 3 in. square.

Place this sample on holder under clip with right edge of sample exactly at the graduation that corresponds with the width of the cloth. Release scale and start weighing with weight on upper beam, using aluminum rod to move weights. Continue if necessary with the weight on the lower beam, leaving previous weight at the extreme right. The position of the weight when the scale is in balance indicates the number of yards per pound of sample.

The Arrest is used for quick, accurate weighing.

Scale should remain unlocked until again transported, when the two shipping arrest nuts should be slightly loosened, moved toward the center as far as possible and again tightened.

FOR YOUR LABORATORY USE
CHRISTIAN BECKER
ANALYTICAL BALANCES

THE TORSION BALANCE CO.

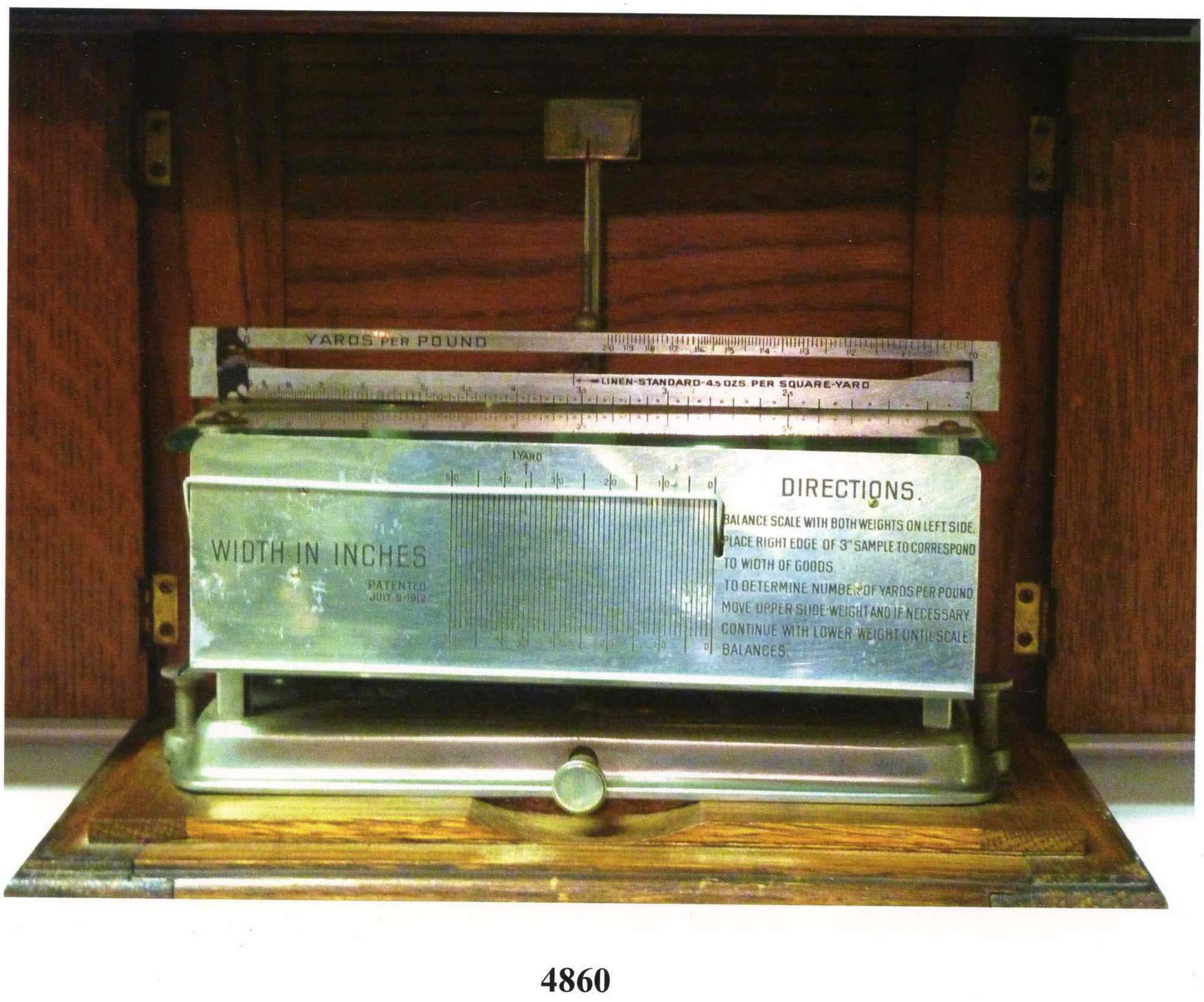
Main Office: 92 *READE STREET, NEW YORK CITY*

Factory and Shipping Address:
147-153 Eighth Street
Jersey City, N. J.

Branch:
31 West Lake Street
Chicago, Ill.

Branch:
49 California St.,
San Francisco, Cal.

The front of this sheet contains the directions for unpacking while the reverse shown at left here tells how to use the scale. The photo below shows the scale which measures 9 7/8" long, 6" deep and 8 1/4 " tall to the top of the index in its oak case.



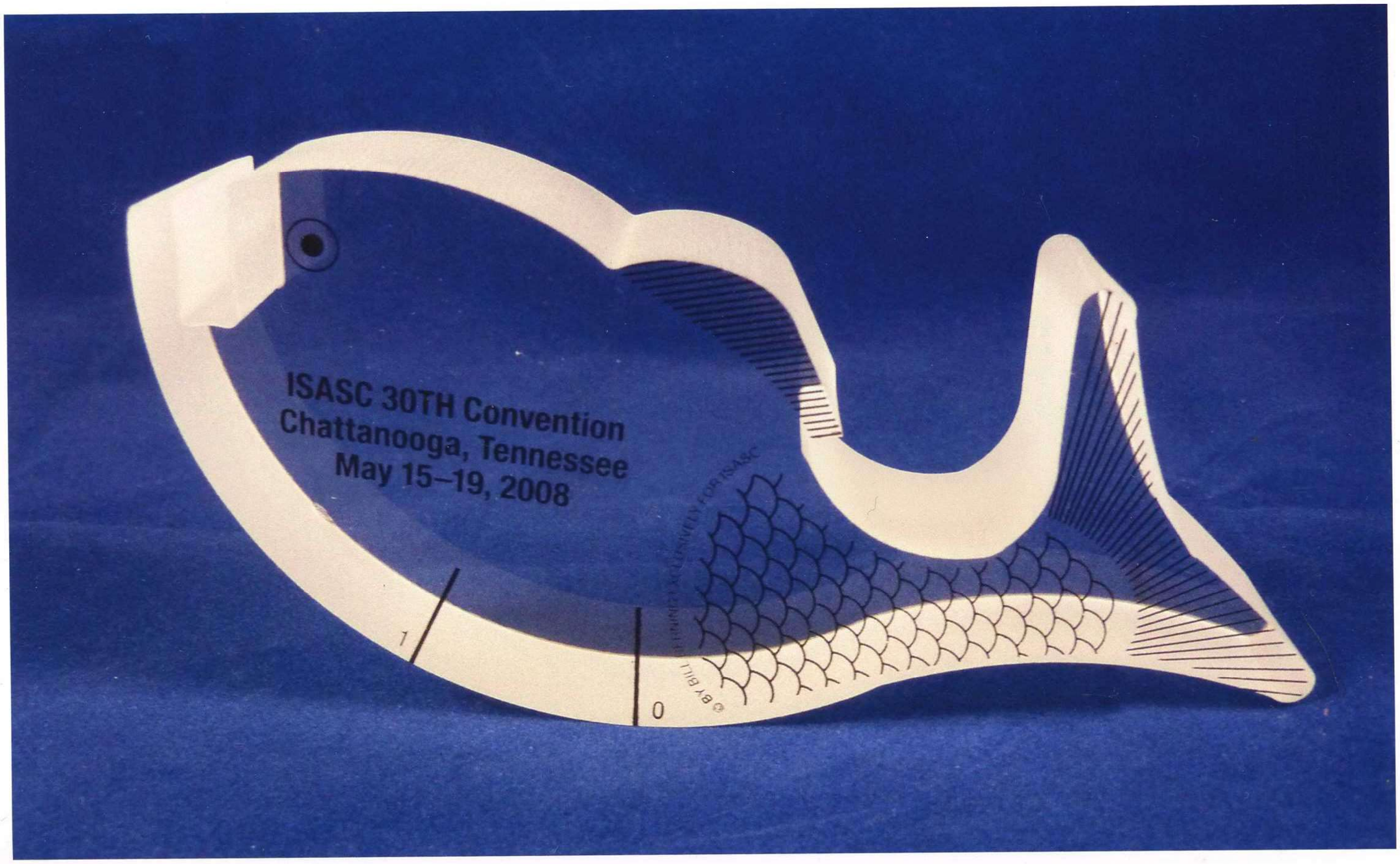
BALANCE SCALE WITH BOTH WEIGHTS ON LEFT SIDE.
PLACE RIGHT EDGE OF 3" SAMPLE TO CORRESPOND TO WIDTH OF GOODS.
TO DETERMINE NUMBER OF YARDS PER POUND MOVE UPPER SLIDE-WEIGHT AND IF NECESSARY CONTINUE WITH LOWER WEIGHT UNTIL SCALE BALANCES.

ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

2021 ISSUE NO. 4 PAGES 4861 - 4888



Cover Picture

The letter scale on our cover was designed by Bill Berning and was given out to attendees at the 2008 Chattanooga, Tennessee, ISASC Convention. It is made of acrylic plastic which was water jet cut and later screen printed in black with a design by Robert Berning. It is used to determine if a letter weighs less or more than 1 ounce.

The first night of the convention started on Thursday with a dinner at the Tennessee Aquarium in Chattanooga. This is the reason the designer chose a fish shaped letter scale.

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ISASC
INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

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Article submissions are preferred in MS Word with Times New Roman Font size 12.
Photos are best in 300 DPI Jpegs in a separate file with a maximum of 3 photos per Email.

Cardboard Letter Scales

BY JAN BERNING

Historically, letter scales have been made of wood, plastic, brass and sterling. However, some of the hardest to find may be made of cardboard. These simple letter scales were cheap to make and were used as advertising gimmicks as early as the 1890s.

In mid-March of 2021, we came across an Ebay auction for an advertising letter scale. This simple design was introduced in a June 15, 1894 issue of *Profitable Advertising* Magazine. The article entitled *A New England Firm Who Have Found Advertising Profitable for the past Two Years*…reads *Angier Chemical Company of Boston, Massachusetts, are said to have made money from their advertising having largely increased the sales of their productions. The company puts out petroleum products: a petroleum emulsion to take the place of cod liver oil; petroleum tablets for coughs; and petroleum soap. …M.J. Lyster,…the president of the company's advertising department…has invented a device called Angier's Letter Scale, for weighing letters for which he has applied for a patent, and which seems to possess all the elements of a successful advertising novelty. It is made from heavy cardboard all in one piece and struck out by dies at one stamp. These afford space for advertising on both sides and we would advise every reader of Profitable Advertising to send for one of them if only to see how well Mr. Lyster has utilized this space.*

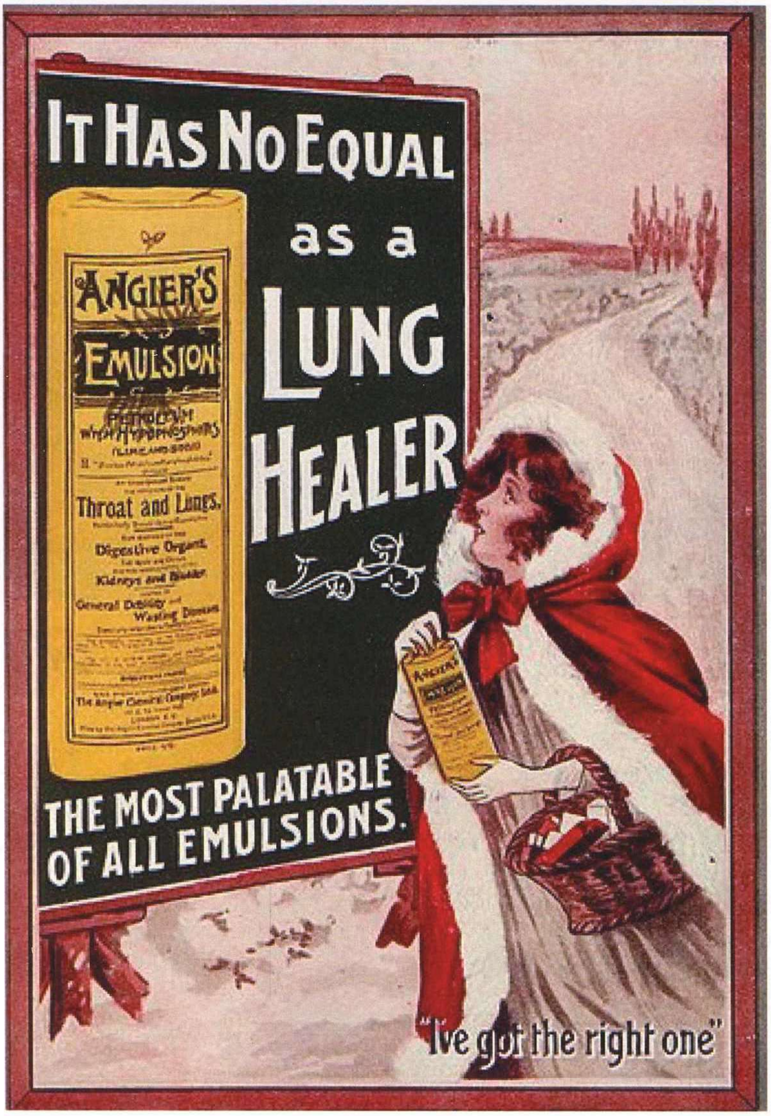
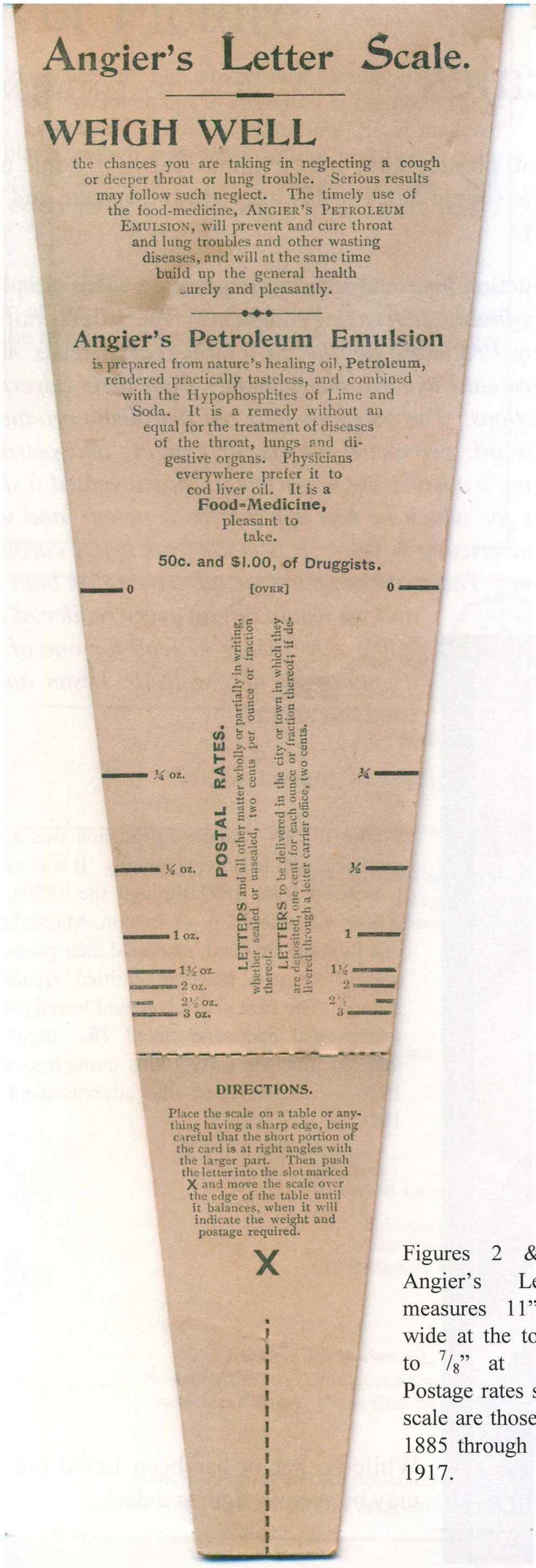

It Has No Equal as a Lung Healer
Angier's Emulsion
Throat and Lungs
Digestive Organs
Kidneys and Bladder
General Debility and Wasting Diseases
The Most Palatable of All Emulsions.
"I've got the right one"

Figure 1. << Angier's Emulsion was a quack medicine said to prevent coughs. It was made of petroleum from 1892 through the 1950s. The Angier Chemical Co. of Boston, Massachusetts, and London, England, marketed their products by giving out two booklets entitled *Health* and *Beauty*. The firm also advertised heavily in their promotional magazine called *The Angier Idea* that ran from the early 1900s through to at least 1936. Angier used this advertisement circa 1910.

While no patent has been found the scale may be seen in figures 2 & 3.


0
¼ oz.
½ oz.
1 oz.
1½ oz.
2 oz.
2½ oz.
3 oz.
0
¼
½
1
1½
2
2½
3

Angier's Letter Scale.

WEIGH WELL

the chances you are taking in neglecting a cough or deeper throat or lung trouble. Serious results may follow such neglect. The timely use of the food-medicine, ANGIER'S PETROLEUM EMULSION, will prevent and cure throat and lung troubles and other wasting diseases, and will at the same time build up the general health surely and pleasantly.

◆

Angier's Petroleum Emulsion

is prepared from nature's healing oil, Petroleum, rendered practically tasteless, and combined with the Hypophosphites of Lime and Soda. It is a remedy without an equal for the treatment of diseases of the throat, lungs and digestive organs. Physicians everywhere prefer it to cod liver oil. It is a **Food-Medicine,** pleasant to take.

50c. and $1.00, of Druggists.

[OVER]

POSTAL RATES.

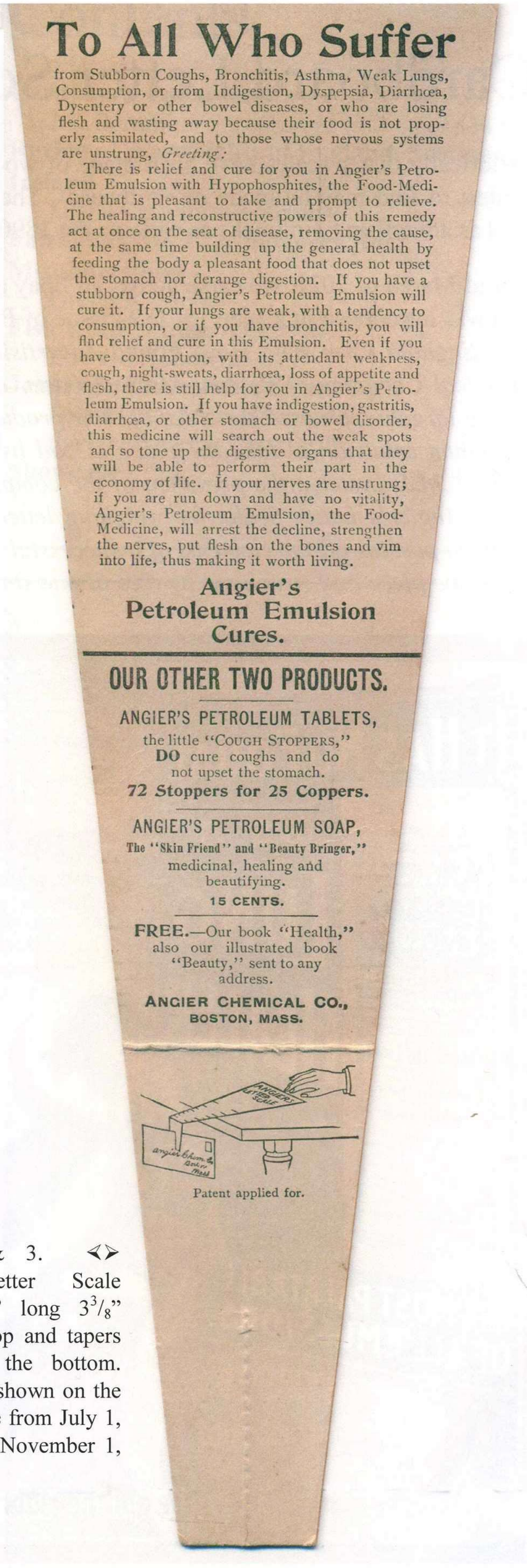
LETTERS and all other matter wholly or partially in writing, whether sealed or unsealed, two cents per ounce or fraction thereof.

LETTERS to be delivered in the city or town in which they are deposited, one cent for each ounce or fraction thereof; if delivered through a letter carrier office, two cents.

DIRECTIONS.

Place the scale on a table or anything having a sharp edge, being careful that the short portion of the card is at right angles with the larger part. Then push the letter into the slot marked **X** and move the scale over the edge of the table until it balances, when it will indicate the weight and postage required.

X


ANGIER'S LETTER SCALE
angier Chem. Co. Boston Mass

To All Who Suffer

from Stubborn Coughs, Bronchitis, Asthma, Weak Lungs, Consumption, or from Indigestion, Dyspepsia, Diarrhœa, Dysentery or other bowel diseases, or who are losing flesh and wasting away because their food is not properly assimilated, and to those whose nervous systems are unstrung, *Greeting:*

There is relief and cure for you in Angier's Petroleum Emulsion with Hypophosphites, the Food-Medicine that is pleasant to take and prompt to relieve. The healing and reconstructive powers of this remedy act at once on the seat of disease, removing the cause, at the same time building up the general health by feeding the body a pleasant food that does not upset the stomach nor derange digestion. If you have a stubborn cough, Angier's Petroleum Emulsion will cure it. If your lungs are weak, with a tendency to consumption, or if you have bronchitis, you will find relief and cure in this Emulsion. Even if you have consumption, with its attendant weakness, cough, night-sweats, diarrhœa, loss of appetite and flesh, there is still help for you in Angier's Petroleum Emulsion. If you have indigestion, gastritis, diarrhœa, or other stomach or bowel disorder, this medicine will search out the weak spots and so tone up the digestive organs that they will be able to perform their part in the economy of life. If your nerves are unstrung; if you are run down and have no vitality, Angier's Petroleum Emulsion, the Food-Medicine, will arrest the decline, strengthen the nerves, put flesh on the bones and vim into life, thus making it worth living.

Angier's Petroleum Emulsion Cures.

OUR OTHER TWO PRODUCTS.

ANGIER'S PETROLEUM TABLETS,
the little "COUGH STOPPERS,"
DO cure coughs and do not upset the stomach.
72 Stoppers for 25 Coppers.

ANGIER'S PETROLEUM SOAP,
The "Skin Friend" and "Beauty Bringer,"
medicinal, healing and beautifying.
15 CENTS.

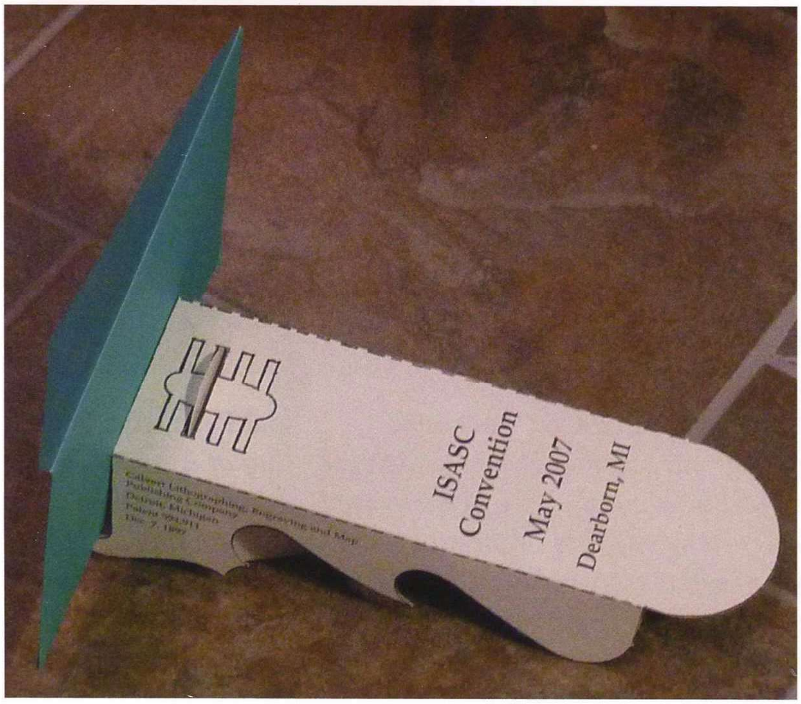
FREE.—Our book "Health," also our illustrated book "Beauty," sent to any address.

ANGIER CHEMICAL CO.,
BOSTON, MASS.

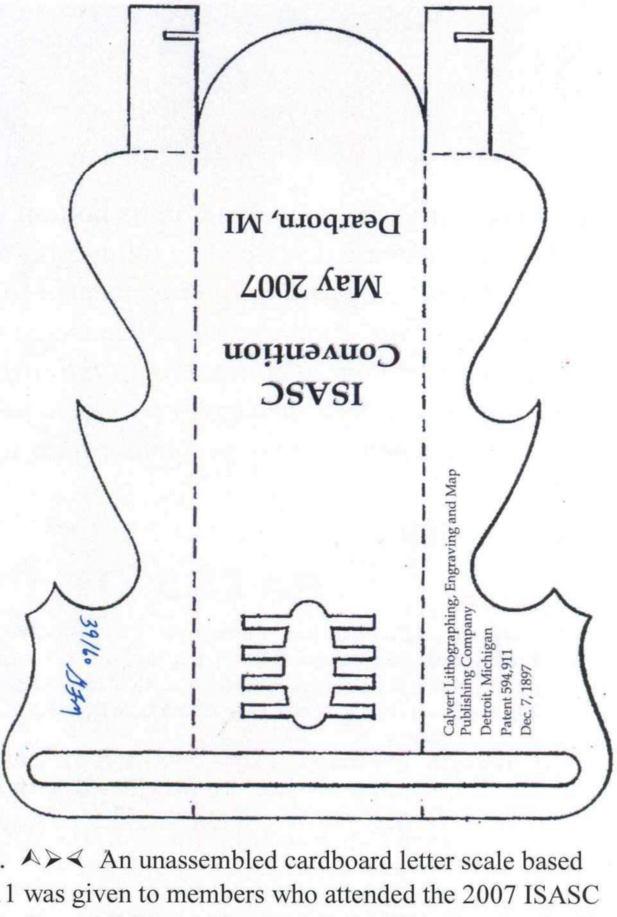
Patent applied for.

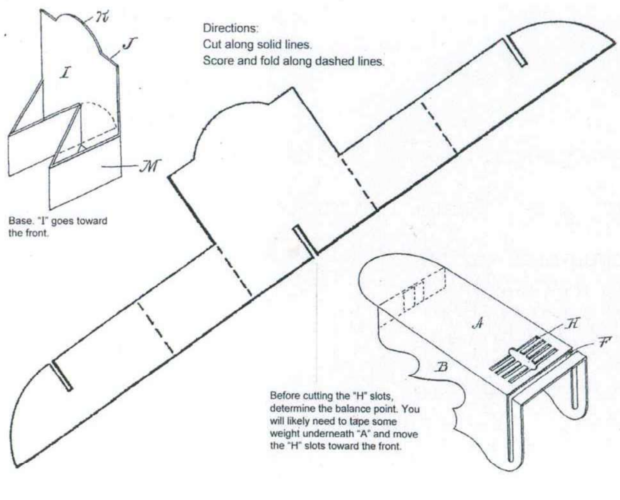
Figures 2 & 3. ◄► Angier's Letter Scale measures 11" long $3^3/_8$" wide at the top and tapers to $^7/_8$" at the bottom. Postage rates shown on the scale are those from July 1, 1885 through November 1, 1917.

Another postal balance was patent number 594,911 issued on December 7, 1897 to Henry B. Seaman of St Louis, Missouri, and assigned to the Calvert Lithographing, Engraving and Map Publishing Company of Detroit, Michigan. The patent reads in part...*The invention consists in the construction of a postal balance constructed of paper or cardboard; and it consists of a weighing-beam formed of a paper or cardboard sheet or plate with depending marginal flanges, a series of openings in one end forming a fulcrum-bearing for different weights of mail-matter, a transverse mail holder formed by a slot near the end of the balance and a fulcrum-block bent from a single piece of cardboard or paper to form a stand, and a fulcrum adapted to engage with the various fulcrum-bearings of the balance-beam, whereby different amounts of postage may be quite accurately determined by shifting the fulcrum into any of the fulcrum-bearings of the balance. For instance, for first fulcrum bearing may be numbered "2" to indicate two-cent postage the next one "4" and the others "6" and "8" respectively, so that at the letters placed in the mail-receptacle F will balance the balance-beam, in the first fulcrum-bearing postage is two cents, if it will balance it in the second fulcrum-bearing four cents, and so on. This is not only a convenient and satisfactory weighing-balance for weighing purposes, but as it is made of paper it may be suitably ornamented or provided with advertising matter, so it will at the same time provide an exceptionally good advertising medium, as it will be kept on the desk and thus constantly remind him of the advertisement which it carries. The entire scale can thus be made from two pieces of cardboard in the manner described.*



It is unknown if this little scale ever went into production in the late 1800s. However, it was produced in a limited-edition of sixty for the ISASC convention of 2007 in Dearborn, MI.





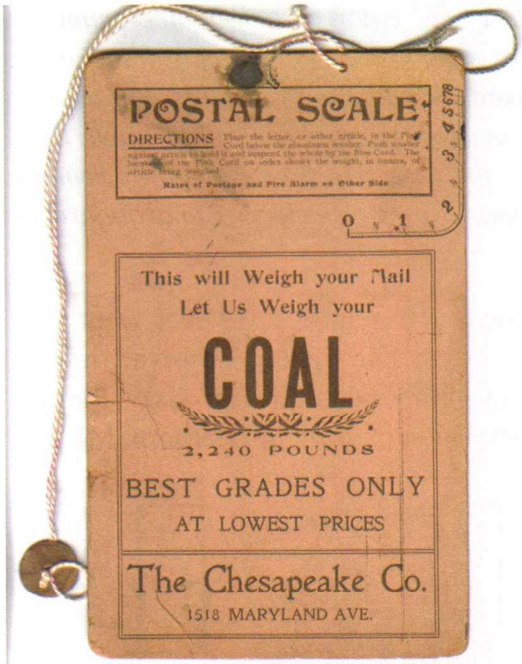
Directions:
Cut along solid lines.
Score and fold along dashed lines.

Base. "I" goes toward the front.

Before cutting the "H" slots, determine the balance point. You will likely need to tape some weight underneath "A" and move the "H" slots toward the front.

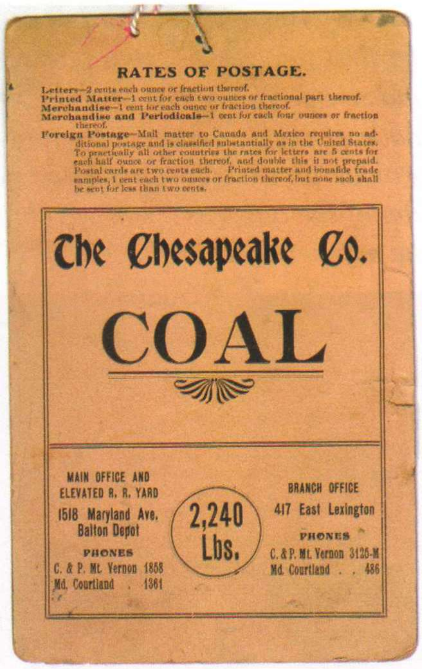
Figures 4, 5, & 6. ▲▶◀ An unassembled cardboard letter scale based on patent 594,911 was given to members who attended the 2007 ISASC Convention in Dearborn, Michigan. Copies were numbered and only 60 were printed on heavy card stock. Complements Judy & Eric Soslau.

Patent number 929,200 was issued on July 29, 1909 to Theodore F. Emans of Lansing, Michigan. Two known examples of this scale exist in members' collections and vary slightly from the patent illustrations. These pendulum scales were made of thick cardboard measuring 4⅞" by 7⅞". One example advertises The Chesapeake Company coal in the state of Maryland, while the other advertises pianos in the state of New York. Both contain rates of postage on their backs and have a postal scale on their fronts which is graduated from 0 to 4 by half ounce and 5 to 8 by 1 ounce. The directions read as follows: *DIRECTIONS place the letter, or other article, in the pink cord below the aluminum washer. Push washer against article to hold it and suspend the whole by the blue cord. The location of the pink cord on index shows the weight, in ounces, of the article being weighed.* See Figures 7a & 7b.

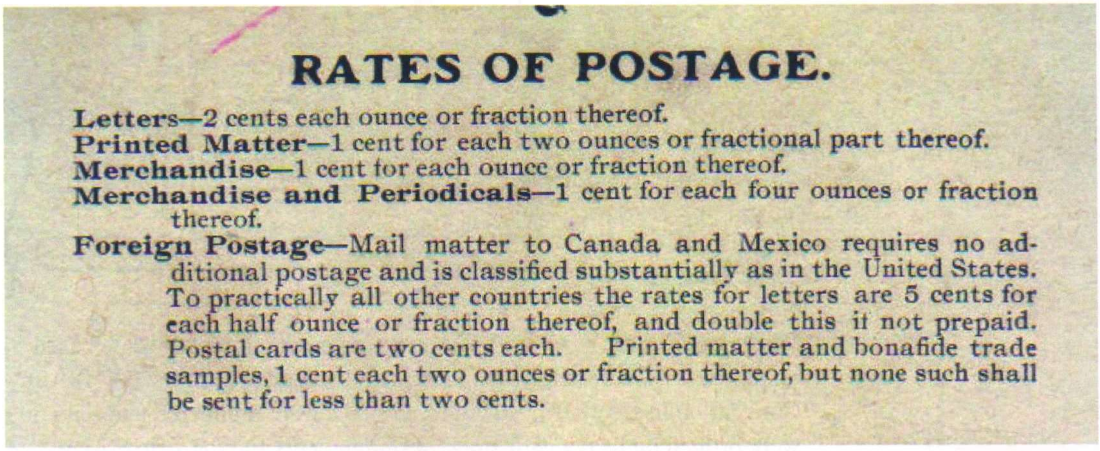


Figures 7a & 7b. ≺≻

Photos complements Mary Katz.



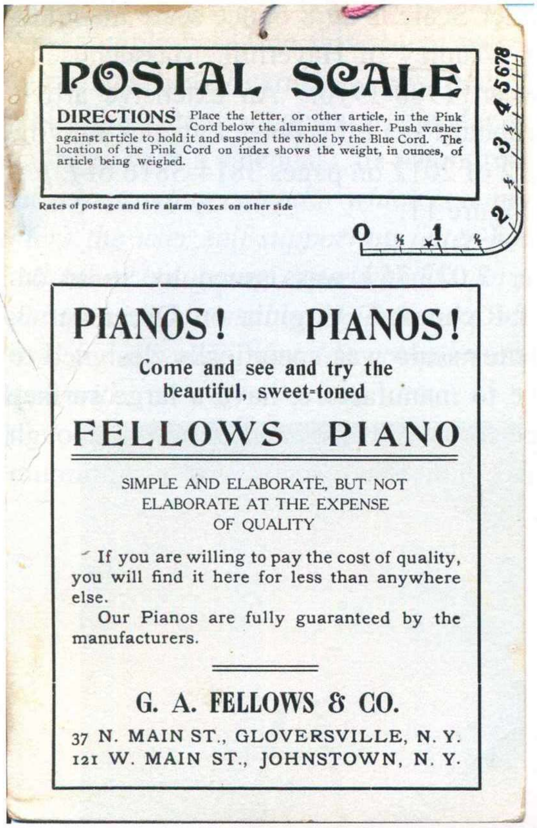
The New York scale is marked on its bottom Unique Advertising Co., Rochester, N. Y. and Patented. These pendulum scales are described as follows on the patent: *...a letter weighing scale consisting of a rectangular card, a flexible suspending loop connected to the card at a point in the vertical median line of this card, a flexible article suspending element connected to the card to one side of the said vertical median line and at a point above the point of connection of the suspension loop there with said card being provided with the scale extending in the arc of the circle concentric to the point of attachment of the article's suspension device to the card said card being free of projections and serving as a counterbalancing element of the scale.* Figures 8, 9 & 10.



RATES OF POSTAGE.

Letters—2 cents each ounce or fraction thereof.
Printed Matter—1 cent for each two ounces or fractional part thereof.
Merchandise—1 cent for each ounce or fraction thereof.
Merchandise and Periodicals—1 cent for each four ounces or fraction thereof.
Foreign Postage—Mail matter to Canada and Mexico requires no additional postage and is classified substantially as in the United States. To practically all other countries the rates for letters are 5 cents for each half ounce or fraction thereof, and double this if not prepaid. Postal cards are two cents each. Printed matter and bonafide trade samples, 1 cent each two ounces or fraction thereof, but none such shall be sent for less than two cents.

Figure 8. ≺≺ The *Rates of Postage* listed on the reverse of these scales are the same on both and can be read at left.



POSTAL SCALE

DIRECTIONS Place the letter, or other article, in the Pink Cord below the aluminum washer. Push washer against article to hold it and suspend the whole by the Blue Cord. The location of the Pink Cord on index shows the weight, in ounces, of article being weighed.

Rates of postage and fire alarm boxes on other side

PIANOS! PIANOS!

Come and see and try the beautiful, sweet-toned

FELLOWS PIANO

SIMPLE AND ELABORATE, BUT NOT ELABORATE AT THE EXPENSE OF QUALITY

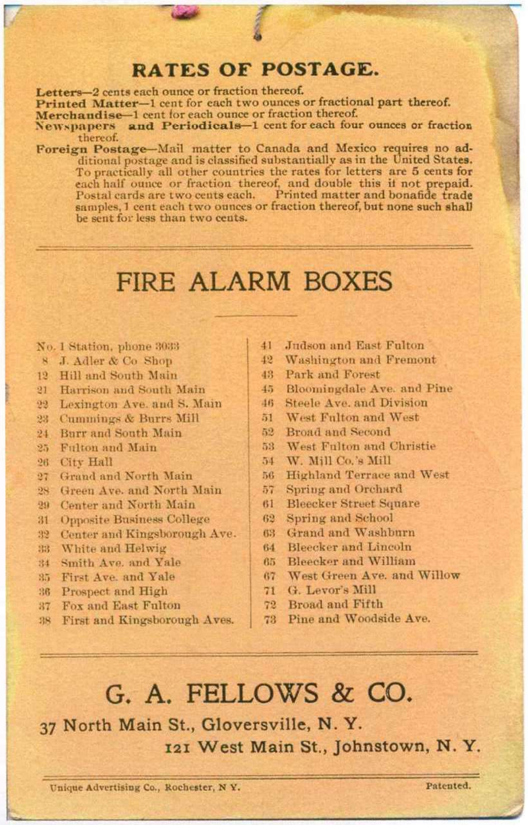
If you are willing to pay the cost of quality, you will find it here for less than anywhere else.

Our Pianos are fully guaranteed by the manufacturers.

G. A. FELLOWS & CO.

37 N. MAIN ST., GLOVERSVILLE, N. Y.
121 W. MAIN ST., JOHNSTOWN, N. Y.

Figures 9. ≺≻



RATES OF POSTAGE.

Letters—2 cents each ounce or fraction thereof.
Printed Matter—1 cent for each two ounces or fractional part thereof.
Merchandise—1 cent for each ounce or fraction thereof.
Newspapers and Periodicals—1 cent for each four ounces or fraction thereof.
Foreign Postage—Mail matter to Canada and Mexico requires no additional postage and is classified substantially as in the United States. To practically all other countries the rates for letters are 5 cents for each half ounce or fraction thereof, and double this if not prepaid. Postal cards are two cents each. Printed matter and bonafide trade samples, 1 cent each two ounces or fraction thereof, but none such shall be sent for less than two cents.

FIRE ALARM BOXES

No. 1	Station, phone 3033
8	J. Adler & Co Shop
12	Hill and South Main
21	Harrison and South Main
22	Lexington Ave. and S. Main
23	Cummings & Burrs Mill
24	Burr and South Main
25	Fulton and Main
26	City Hall
27	Grand and North Main
28	Green Ave. and North Main
29	Center and North Main
31	Opposite Business College
32	Center and Kingsborough Ave.
33	White and Helwig
34	Smith Ave. and Yale
35	First Ave. and Yale
36	Prospect and High
37	Fox and East Fulton
38	First and Kingsborough Aves.
41	Judson and East Fulton
42	Washington and Fremont
43	Park and Forest
45	Bloomingdale Ave. and Pine
46	Steele Ave. and Division
51	West Fulton and West
52	Broad and Second
53	West Fulton and Christie
54	W. Mill Co.'s Mill
56	Highland Terrace and West
57	Spring and Orchard
61	Bleecker Street Square
62	Spring and School
63	Grand and Washburn
64	Bleecker and Lincoln
65	Bleecker and William
67	West Green Ave. and Willow
71	G. Levor's Mill
72	Broad and Fifth
73	Pine and Woodside Ave.

G. A. FELLOWS & CO.

37 North Main St., Gloversville, N. Y.
121 West Main St., Johnstown, N. Y.

Unique Advertising Co., Rochester, N Y. Patented.

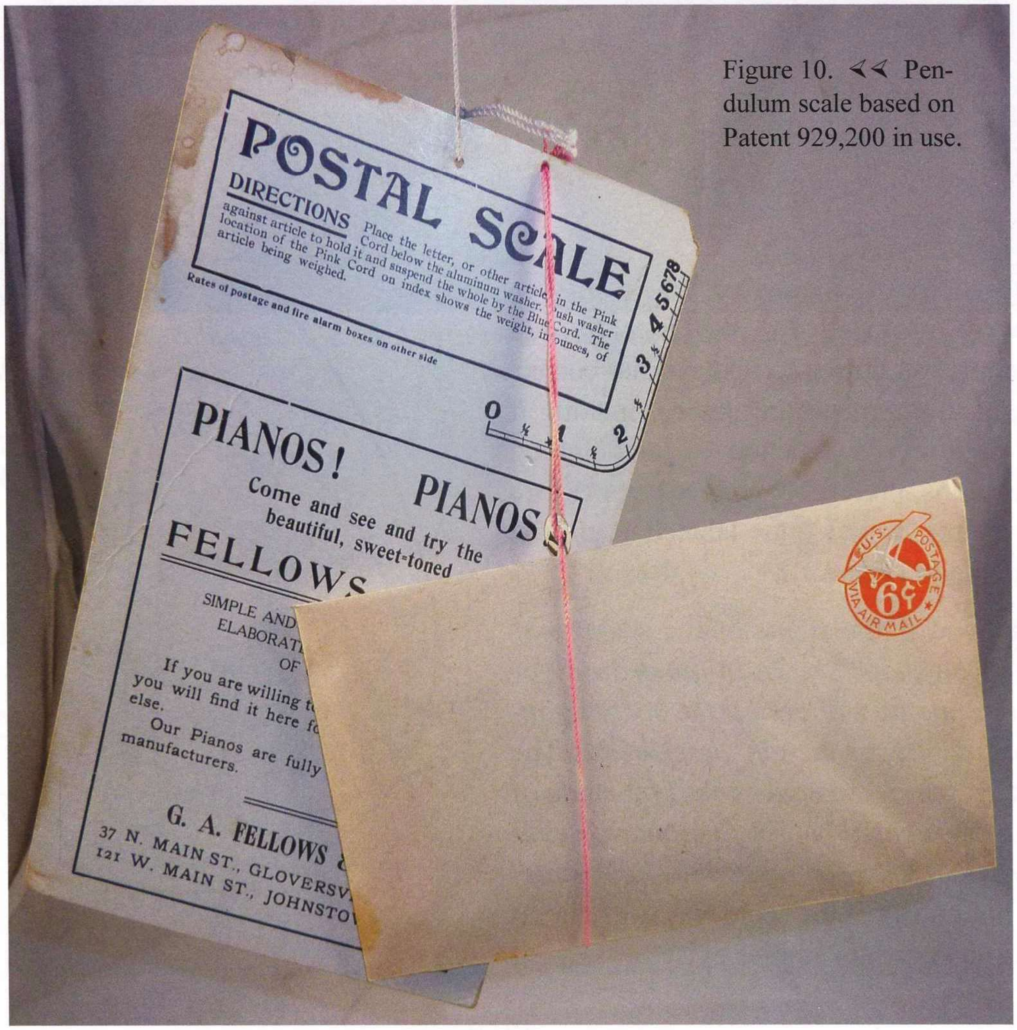


Figure 10. ≺≺ Pendulum scale based on Patent 929,200 in use.

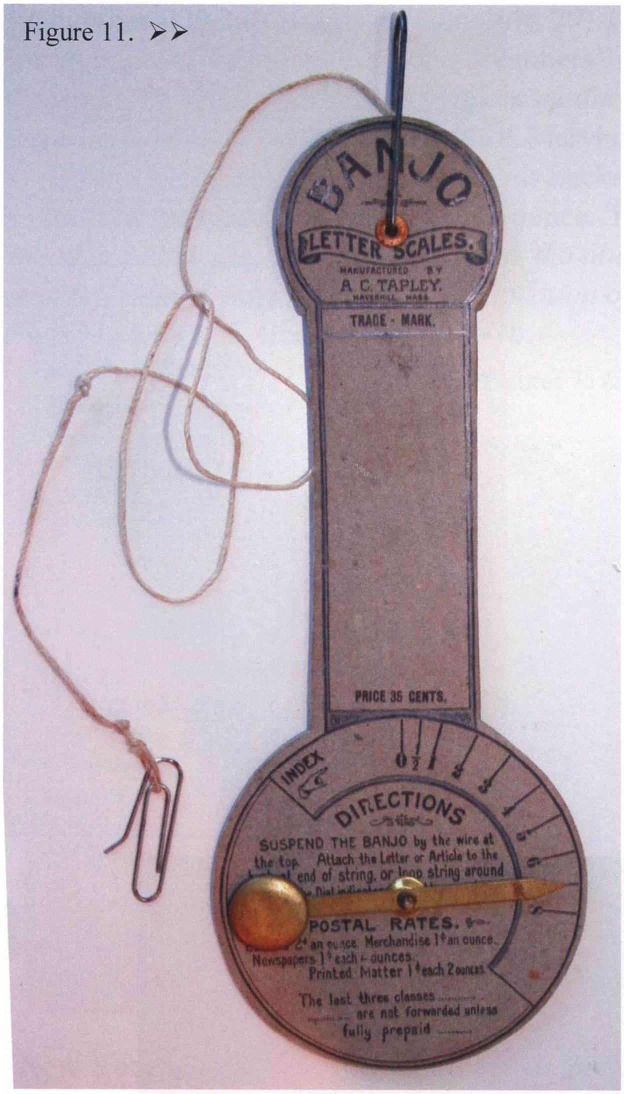


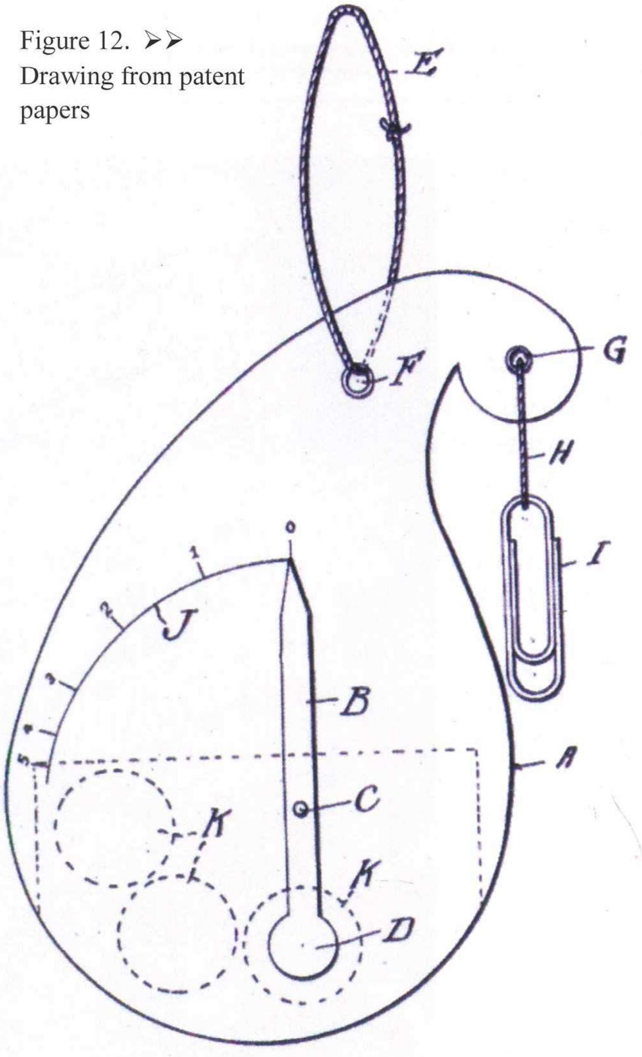
Figure 11. ➢➢

BANJO
LETTER SCALES.
MANUFACTURED BY
A. C. TAPLEY
HAVERHILL MASS
TRADE-MARK.
PRICE 35 CENTS.
INDEX
0 ½ 1 2 3 4 5 6 7 8
DIRECTIONS
SUSPEND THE BANJO by the wire at the top. Attach the Letter or Article to the end of string, or loop string around
POSTAL RATES.
2¢ an ounce. Merchandise 1¢ an ounce.
Newspapers 1¢ each 4 ounces.
Printed Matter 1¢ each 2 ounces.
The last three classes are not forwarded unless fully prepaid

The Banjo Letter Scale is an 8 ounce scale manufactured by A. C. Tapley of Haverhill, Massachusetts, possibly between 1900-1910. An extensive article about this cardboard scale by Peter Laycock may be found in issue 2 of 2012 on pages 3814-3816 of *Equilibrium*. See Figure 11.

Patent number 2,022,753 was issued to Stuart M. Woodward of Richmond, Virginia on December 3, 1935. This letter scale was specifically designed to be inexpensive to manufacture, have a large surface area to be used for advertising, and of a light enough weight to mail individual scales for a minimum amount of postage.

Figure 12. ➢➢
Drawing from patent papers



To help keep the scale lightweight, one or more pockets were provided for the user to add "unworn coins" as poises to achieve the correct scale weight to complete the device, making it ready to perform its function as a weighing scale. The coins, preferably copper pennies, are indicated by the dotted lines labeled K on the patent drawing in Figure 12.

Also mentioned is the shape of the scale: *may either be of the shape shown in the drawing or such other shape as will permit the scale to operate substantially as herein described.* The patent further states *the scale could be made of cardboard, corrugated board, fiberboard, celluloid, wood, aluminum, or other thin light material.* It is not known if the scale was ever manufactured as no known examples exist.

Patent number, 3,281,975 was issued on November 1, 1966 to Edward J. Simone of Afton, Missouri. Our example based on this patent was used to advertise Mercantile Trust Company in St. Louis, Missouri. This heavy cardboard inverted V shaped rocker is made for one ounce and two-ounce letters. While the patent suggests a calendar with a letter weighing means; our example of this scale is not equipped with a calendar. Its patent reads in part *the principal object…is to provide a simple, economical self-standing calendar which is compact and convenient and which (with or without calendar media) offers the user self-supporting letter-holding and weighing facilities devoid of counterweights, springs and other balancing expediencies. In fact, the innovation provides an adaptation wherein selectively and collectively usable facilities are incorporated in a self-contained manner, whereby to obviate the need for separate movable component parts which soon get out of order or are otherwise difficult to cope with.*

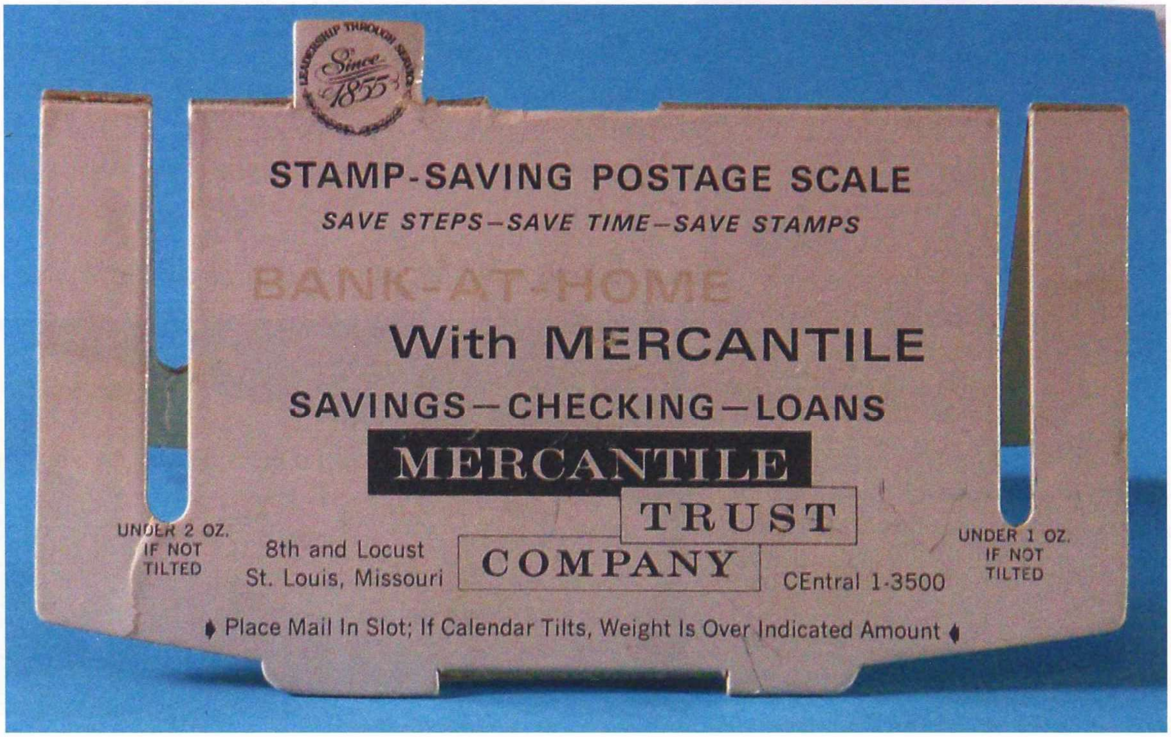
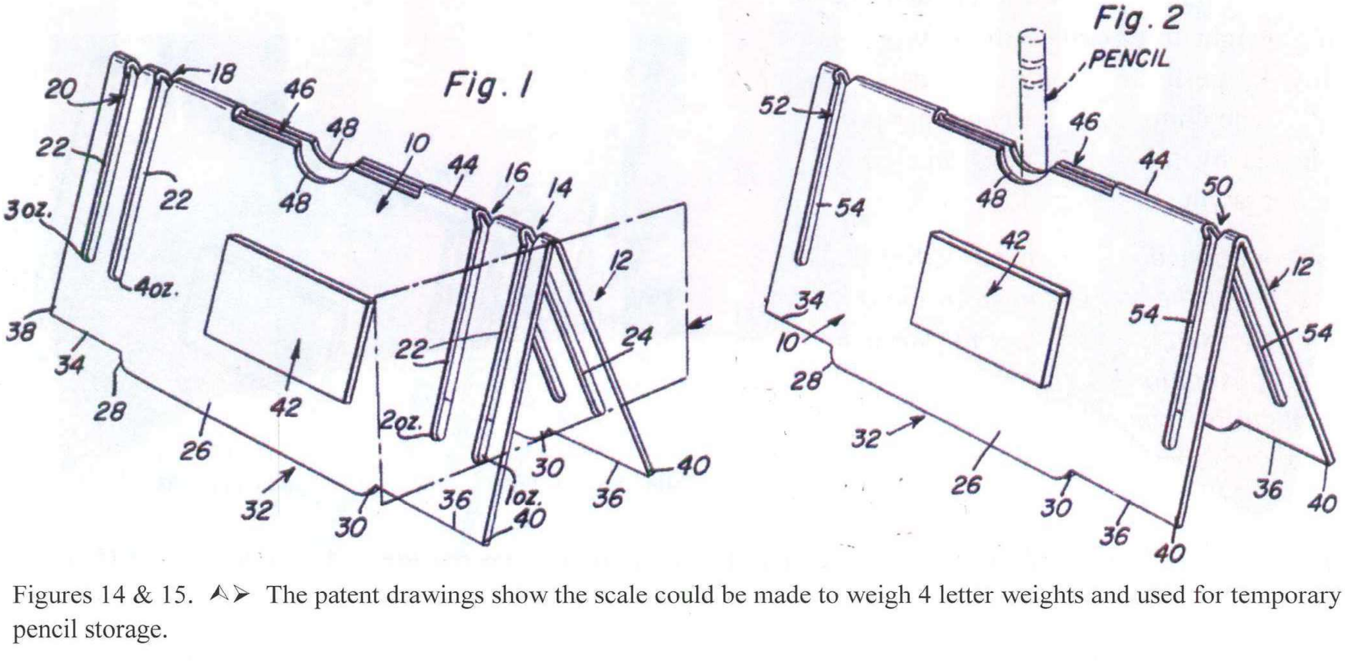

LEADERSHIP THROUGH SERVICE
Since 1855
STAMP-SAVING POSTAGE SCALE
SAVE STEPS—SAVE TIME—SAVE STAMPS
BANK-AT-HOME
With MERCANTILE
SAVINGS—CHECKING—LOANS
MERCANTILE
TRUST
COMPANY
UNDER 2 OZ. IF NOT TILTED
8th and Locust
St. Louis, Missouri
CEntral 1-3500
UNDER 1 OZ. IF NOT TILTED
Place Mail In Slot; If Calendar Tilts, Weight Is Over Indicated Amount

Figure 13. ▲▲ The scale based on Patent No. 3,281,975 has spaces for letters weighing under 1 and 2 oz.



Figures 14 & 15. ▲➤ The patent drawings show the scale could be made to weigh 4 letter weights and used for temporary pencil storage.

The EasyWeigh Letter Scale was dated between 2000 and 2007 by Innovation Affairs in the Netherlands. Each scale is marked *Design Registered* and *Patent Pending Worldwide.* They were printed in many designs and for use in the countries of The Netherlands, Chile, Slovakia, England, Belgium, Germany, European Mail and possibly others. One example could be used as a holiday card. Most were printed on flat white cardboard to be folded and assembled by the user. According to the website http://www.easy-weigh.com/tools/letterscale.html the scales could be graduated from 15 to 100 grams depending on the postal requirements in your area.

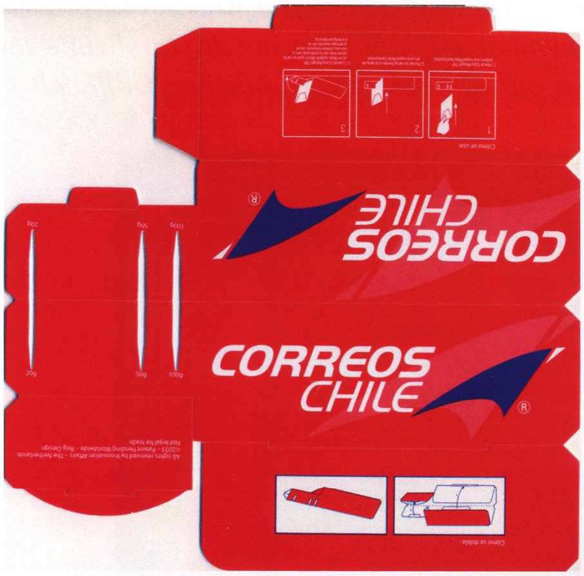
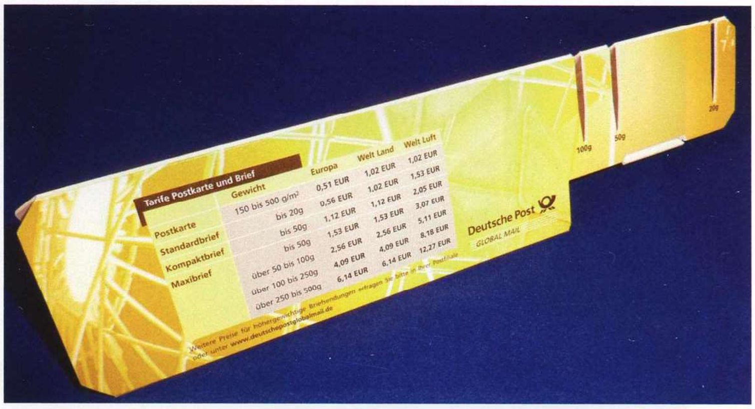


Figure 16. ≺≺ The EasyWeigh Letter Scales were printed on flat white cardboard which was scored for easy folding.

Figure 17. ≻≻ When assembled, by the user, the EasyWeigh was a rocker style of letter scale, with slots to hold the letter while it was being weighed.



Tarife Postkarte und Brief

	Gewicht	Europa	Welt Land	Welt Luft
Postkarte	150 bis 500 g/m²	0,51 EUR	1,02 EUR	1,02 EUR
Standardbrief	bis 20g	0,56 EUR	1,02 EUR	1,53 EUR
Kompaktbrief	bis 50g	1,12 EUR	1,12 EUR	2,05 EUR
Maxibrief	bis 50g	1,53 EUR	1,53 EUR	3,07 EUR
	über 50 bis 100g	2,56 EUR	2,56 EUR	5,11 EUR
	über 100 bis 250g	4,09 EUR	4,09 EUR	8,18 EUR
	über 250 bis 500g	6,14 EUR	6,14 EUR	12,27 EUR

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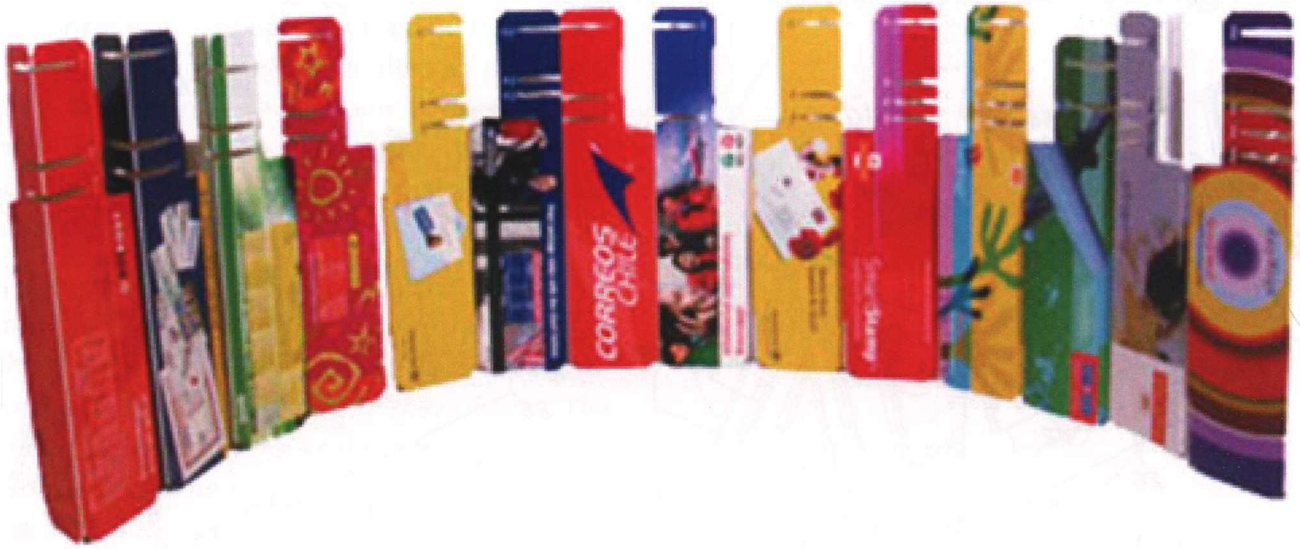


Figure 18. ⩓⩓ These assembled EasyWeigh Letter Scales were made for many countries and in capacities from 15 to 100 grams.

Review

Coin-weights of England, Scotland and Ireland, Volume 1 of the forth-coming series *Coin-weights of Europe* by Paul & Bente Withers, (www.galata.co.uk) The Old White Lion, Market Street, Llanfyllin, Powys, SY22 5BX, UK. 104 A4 pages[1], with hundreds of coin-weights illustrated life size. Price £22 plus packing & postage. Available from the authors.

Another fascinating book about coin-weights, full of pictures, setting the weights into context, and giving collectors a lot of pleasure.

Paul and Bente Withers are known for their immense scholarship and writing on the subject of coin weights, having previously published *British Coin-Weights*, (368 A4 pages[1]) the reference book for collectors, and *Lions, Ships and Angels* (80 A5 pages[1]) for people wanting help when they have found a coin -weight in Britain. Now they have published *A Guide to the Coin-weights of England, Scotland and Ireland*, (104 A4 pages) showing samples of each known design of weight, quoting the reference numbers from *British Coin-weights*.

They explain the reason for each change of design in relation to the coins to be checked, that need a huge amount of history slipped in so smoothly that the reader is scarcely aware of it. With their lively prose and erudition, it is easy to learn and understand the necessities for changes between 1272 AD and 1850 AD. And one learns a lot about the coinage that caused all the complications.

The book is very useful for collectors because the Withers give estimates of numbers produced, for how long and by whom, where there is evidence. Some collectors care about the rarity of their weights, and because the Withers have handled such huge numbers of weights, they have an excellent over-view of their production. For those of us more interested in the meaning of the symbols that crowd the surface of the weights, the authors give detailed explanations..

There are some brief but amusing biographies of weight makers, with photographs of 11 scales, and four trade labels.

One category of coin weights is ignored - the knobbed weights, produced in large numbers between about 1750 AD and 1820 AD. And the special weights for hydrostatic weighing of coins are not mentioned unfortunately even though they were usually monetiform.

Michael Crawforth had a cut-off point when he was buying a book. If it contained 10 facts new to him, he would pay £10. If we applied the same criterion to this book, most of us would pay several hundred pounds! Luckily it is only £22.

This book is wonderful, packed with details, but never confusing, always vigorous but never oppressive, always lucid but never nit-picking. If you have any coin-weights, this book will make you enjoy them even more than you did before.

Endnote

1. A4 pages are 11¾ inches by 8¼ inches. A5 pages are half that size, so 8¼ inches by 5¾ inches.

DFCH

Fairbanks No. 1 … A Balance Often Misunderstood

BY GREGG A. MOTTER

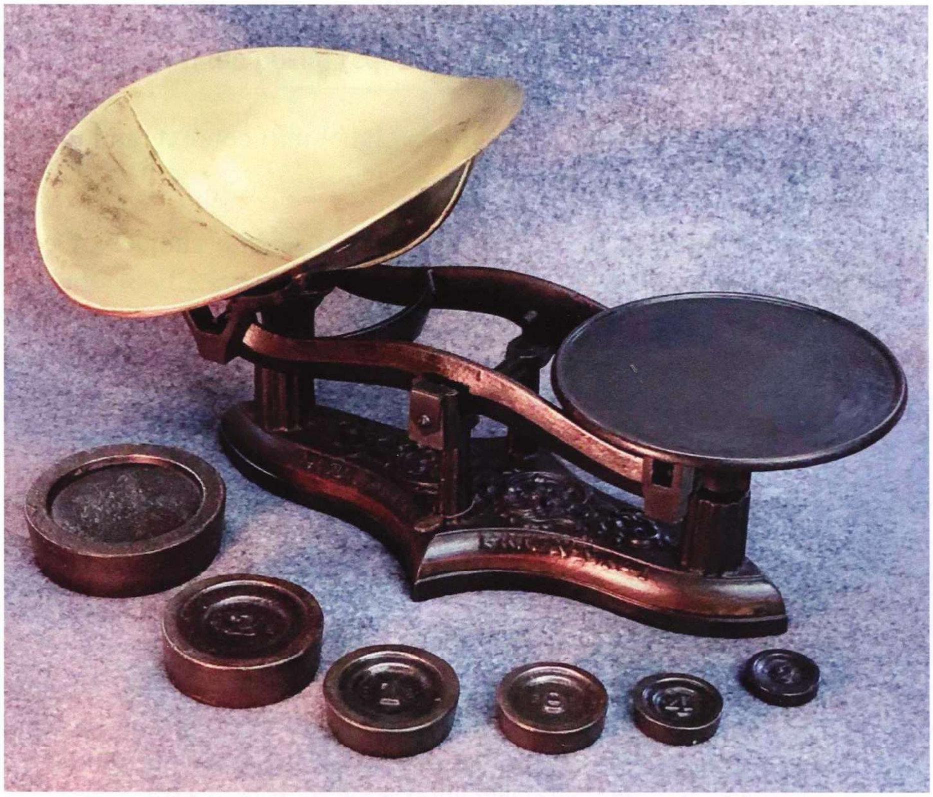


Figure 1. ≺≺ Fairbanks No. 1 was one of their first production small balances around 1830, and remained in production to around 1869.

Introduction:

This scale takes us back a century and a half to the days of the old-fashioned General Store. These stores sold almost everything in bulk: food, candy, tobacco, tea, hardware, material to make clothing, etc. The customers stood at the front counter and told the shop-keeper what they wanted, and the desired quantity. The shop-keeper would then run around the store gathering merchandise, measuring or weighing out the desired quantity, and packaging it in a way suitable to take home.

Fairbanks No. 1 Discussion:

The Fairbanks No. 1 Counter Balance is very decorative. The top of the base is highly decorated with molded scroll-work, leaves, and flowers providing a very stunning appearance. See Figure 2.

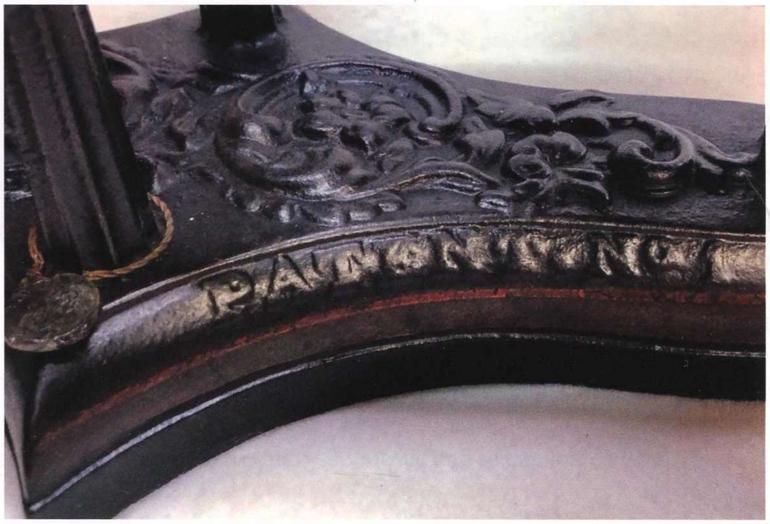


Figure 2. ➢➢ Incredible lettering, scrollwork, and flowers molded into the cast iron base. Also visible is the lead verification seal from 1926 and 1932.

Around the perimeter of the base there are attractive hand-painted maroon and gold bands. Just above these bands, are four sections of text cast into the iron base. On the front it says "Fairbanks" and "Patent No. 1", and on the back-side "St. Johnsbury" and "Vermont US". See Figure 2. This balance was not Fairbanks' first patent, as many have assumed. The lettering is simply stating this is their model No. 1 balance, and that the balance is patented.

The balance is very unusual from many perspectives. The beam supports are cast as fluted columns. See figure 3. Lifting your eyes up you find the beam is a 'moustache' design with a very attractive hand painted gold line design. Upon initial inspection of Figure 1, the bearing design appears to be different on each end of the moustache beam. This is misleading. The bearings are identical in design. The design of the fork and pan support are very different leading to an incorrect impression.

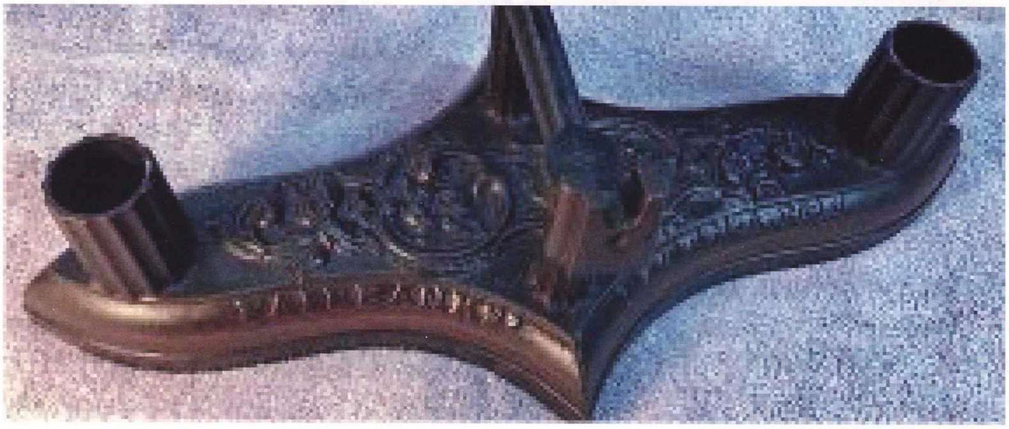


Figure 3. ≺≺ Shows the ornate cast details on the one-piece base.

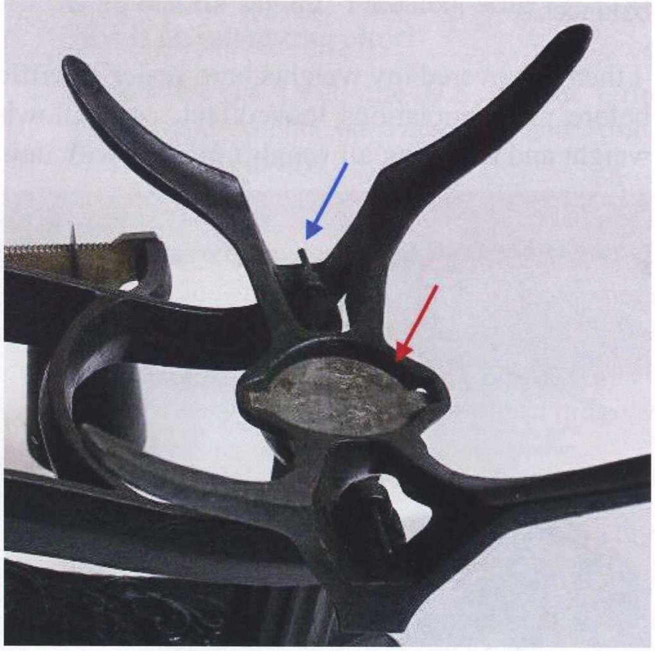
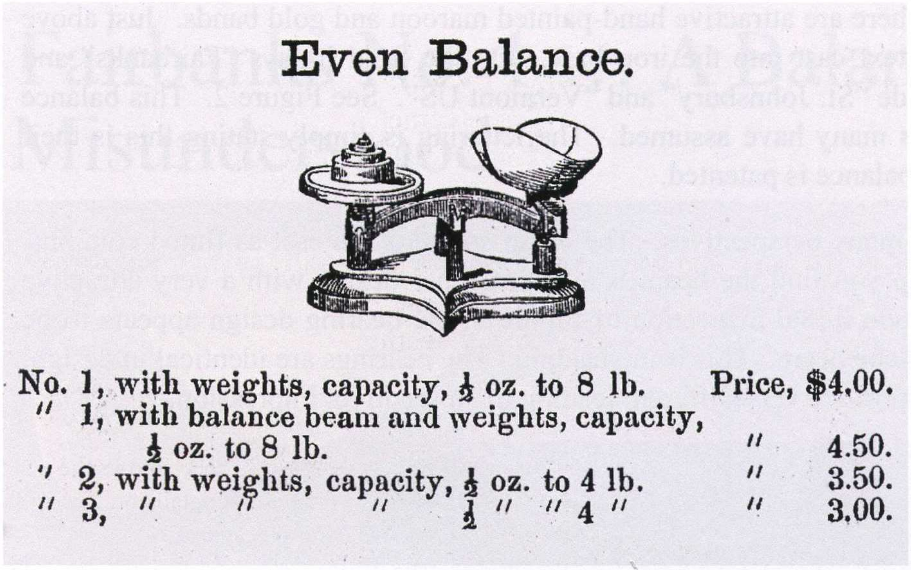


Figure 4. ➤➤ Blue arrow shows pin located above all four bearing assemblies holding the balance together, and red arrow shows the easily removable cover for the balancing lead shot.

It is interesting to note the fork and pan support are held onto the balance by means of pins that need to be pulled out to disassemble the balance. Lastly, the counter-balancing pod[1] (that allows the beam to be adjusted for any scoop or pan regardless of its mass) has a cover that just snaps into place making it very easy for the shop owner to 'tinker' with the honesty of the scale…if he should so desire! See Figure 4. The scale's vital statistics are: 8 pounds weighing capacity, 17" L, 6" H, 6 3/8" W, and weighing in at 14 Lbs. for the balance alone without the weights. When the entire set was delivered it weighed 22 Lbs., and cost a shop owner $4.00 in 1859. See Figure 5.



Even Balance.

No. 1,	with weights, capacity, ½ oz. to 8 lb.	Price,	$4.00.
" 1,	with balance beam and weights, capacity, ½ oz. to 8 lb.	"	4.50.
" 2,	with weights, capacity, ½ oz. to 4 lb.	"	3.50.
" 3,	" " " ½ " " 4 "	"	3.00.

Figure 5. Fairbanks 1859 catalog entry for the No. 1 balance, and the No. 2 and No. 3 balances introduced in that catalog issue.

I bought this balance on eBay from the grandson of the original owner. It was used by his grandfather in a general store in Schoharie, NY, his father at his apothecary in Glastonbury, CT, and the grandson on a small produce farm in Ann Arbor, MI. The balance still retains one of its lead sealer's tags stamped 1926 on one side, and 1932 on the other.

The balance came with an interesting set of weights, which I believe to be original to the balance. After removing several layers of rust and crud, I made several interesting observations. All the weights, except the 4 lb. one, were made in the same way as S. Mordan made his weights in England, with an inner ring to prevent the weight on top in the stack from rubbing on the numbers on the weight below. See figure 1. I have not seen weights made in this manner by any other U.S. weight maker, and Fairbanks only used this design for a very short period, and then only with their high-end balances.

I then discovered my weights bore sealer's verification marks. All weights were produced around 1900, before new regulations took effect, only allowing one adjusting hole drilled into the bottom of the weight and requiring all weights marked with units. See Figure 6 A & B.

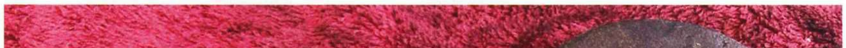


Figure 6 A. Red stars indicate areas on the back of each weight bearing sealer's verification marks.

Weight	Year Sealed
4 Lb.	1911, 20, 21, 22
2 Lb.	1911, 13, 17, 19, 20, 21, 22
1 Lb.	1911, 13, 17, 19, 20, 21, 22
8 Oz.	1911, 13, 17, 19, 20
4 Oz.	1911, 13, 17
2 Oz.	1911

Figure 6B. Table in Figure 6B is a summary of Sealer's marks on each weight.

This balance went into production at the Fairbanks foundry at St. Johnsbury, Vermont around 1830 with no side beam. Therefore, it required the use of loose weights for all measurements, and came with a full set of cast iron weights 4 lbs. down to 1 oz. If a patent was ever issued for this balance, the documentation was lost in the U.S. Patent Office fire on December 15, 1836.

After the Patent Office fire, Fairbanks applied for, and was granted, a reissue of many of their patents. In other cases, Fairbanks incorporated the main elements of their old patent into a new patent along with new and novel concepts to obtain the new patent, and another 14 years of protection. It appears Fairbanks used that strategy with this balance.

Side Beam Patent Discussion:

On July 17, 1848, Thaddeus Fairbanks filed for a U.S. Patent titled *"Improvement in Double-Scale Balances"*. This patent was issued on March 13, 1849 as U.S. Patent No. 6169. See Figure 7. The principle of the invention was stated as *"The peculiar object of the improvement is to enable a person on the double-scale-pan lever balance, or that made with equal lengths, to obtain fractional parts of a pound or ounce without rendering it necessary to employ a series of small weights, such as represent a half-pound, a quarter-pound, an ounce, half-ounce, or quarter-ounce."* Interesting to note, the use of a side beam on a roberval balance was not done in England!

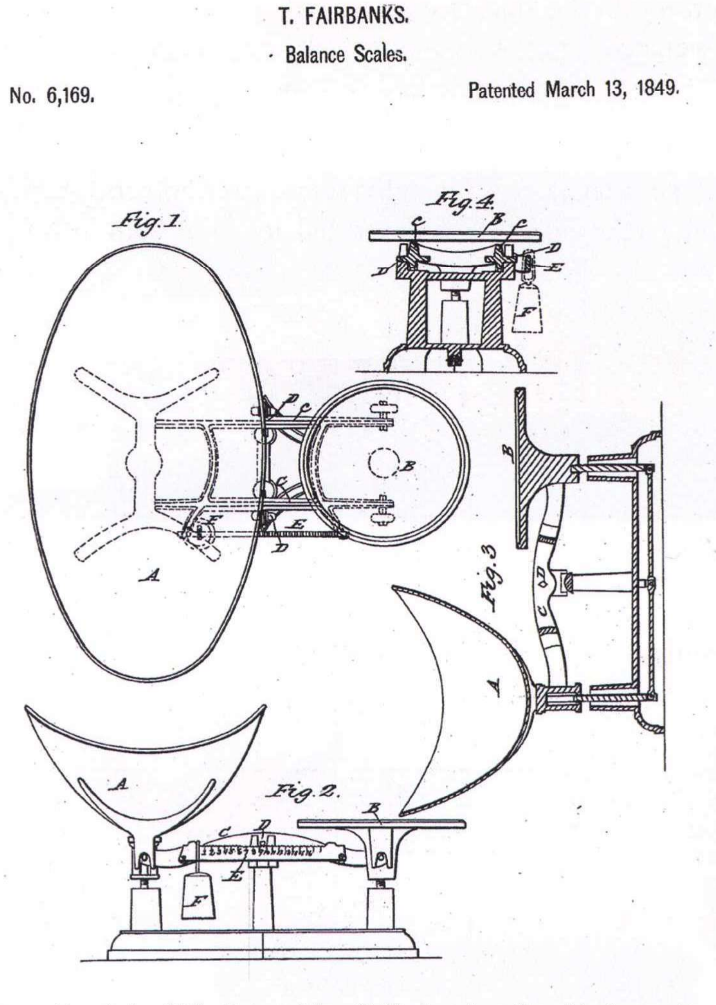


Figure 7. ▲▲ U.S. Patent No. 6169 drawing for side beam improvement.

Cast into the base of my balance, on the underside of the base above the roberval arms, there is a notation saying "Patented, Aug.12, 1848". This is an interesting error!

- Starting in 1848, the U.S. Patent Office only issued patents on Tuesdays, and August 12th was a Saturday!
- In the entire history of the U.S. Patent Office, they only issued non-Tuesday patents eight times, and this was not one of them.
- My scale is apparently post 1848 production since it bears the embossed erroneous patent date, and it appears Fairbanks used the same bases on the balances with and without side beams.

Conclusion:

Without a doubt, this is the most visually appealing and decorative balance Fairbanks ever produced resulting in it being highly sought-after by collectors. It is now quite rare, and only occasionally come up for sale.

End Note:

1. The counter-balancing pod was called a "balancing box" by Fairbanks Co. London when they applied for approval of one in March 1907. The Board of Trade gave Fairbanks permission to make it for use in the UK.

Fish Knife Scales, A Survey

BY EDWARD KONOWITZ

Figures 1A & 1B. This 12 pound capacity Puma fish knife scale was made in Solingen, Germany. It is made of stainless steel and is about 5 7/8 inches long closed. It is also available in kilos. The user would hold the leather strap with the fish suspended on a line over one of the notches on top of the blade. Slide the line to the notch where balance is achieved to show weight of the fish. Other sizes and capacities were also made.

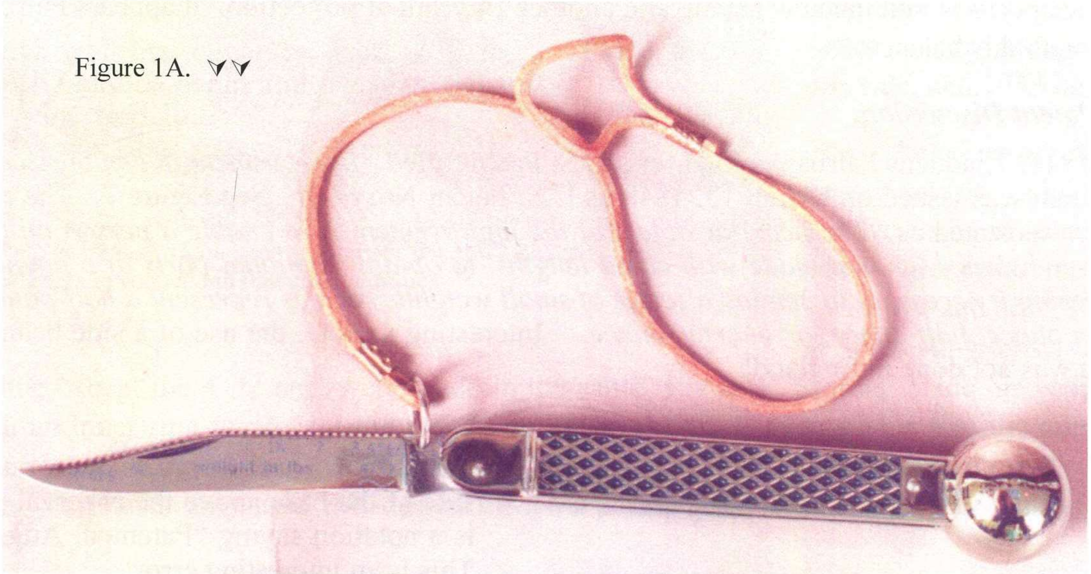


Figure 1A. ⋎⋎

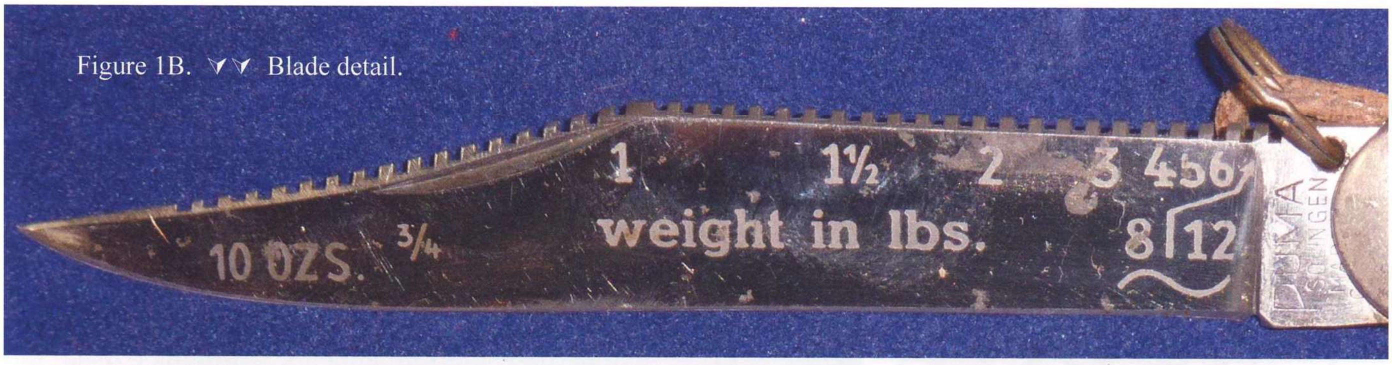


Figure 1B. ⋎⋎ Blade detail.

Figure 2. Rosewood handle version of the Puma knife.

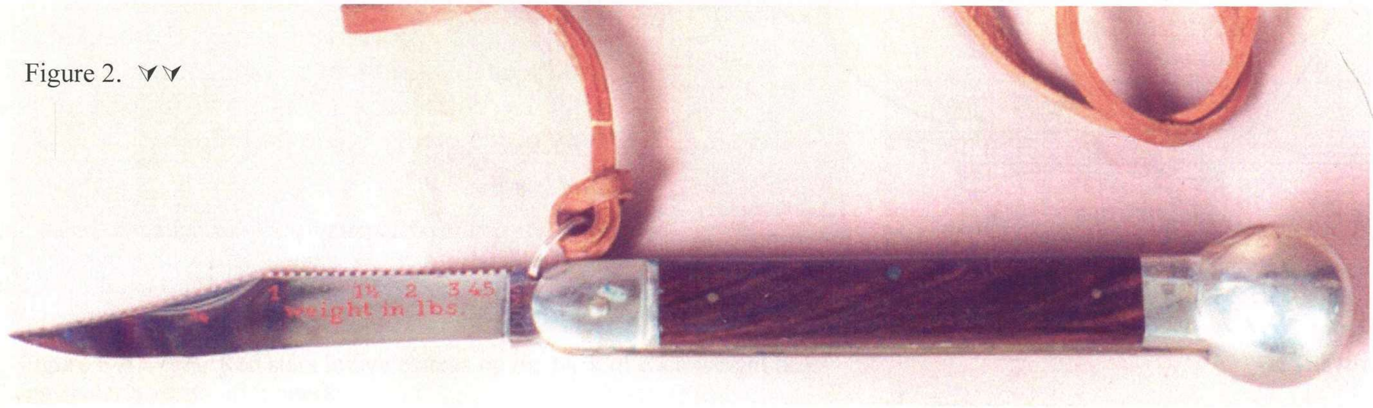


Figure 2. ⋎⋎

Figure 3. This brass handle knife is similar in shape and use to the Puma knives. It is made in Italy with a capacity of 2 kg.

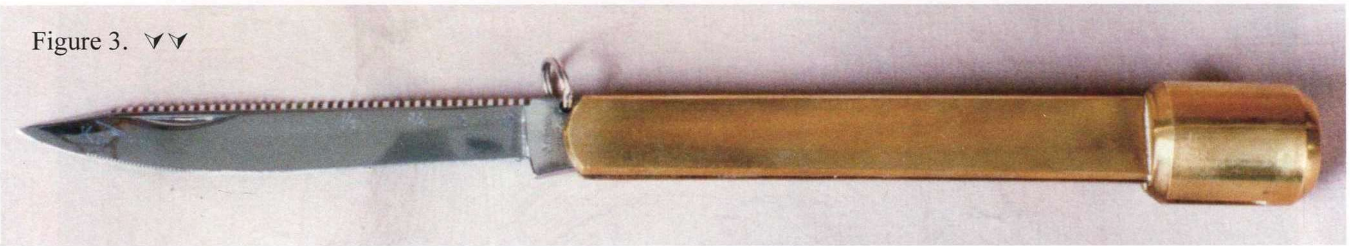


Figure 3. ⋎⋎

Figures 4A, B, C, D, E. The Fishweigh was made in Cary, North Carolina. Some of these scales are also marked Germany on the blade. The wire scale handle folds down to tuck into a slot on the handle. There is a storage space cut into the back of the sheath for the hanger wire. The knife measures about 9¾ inches long.

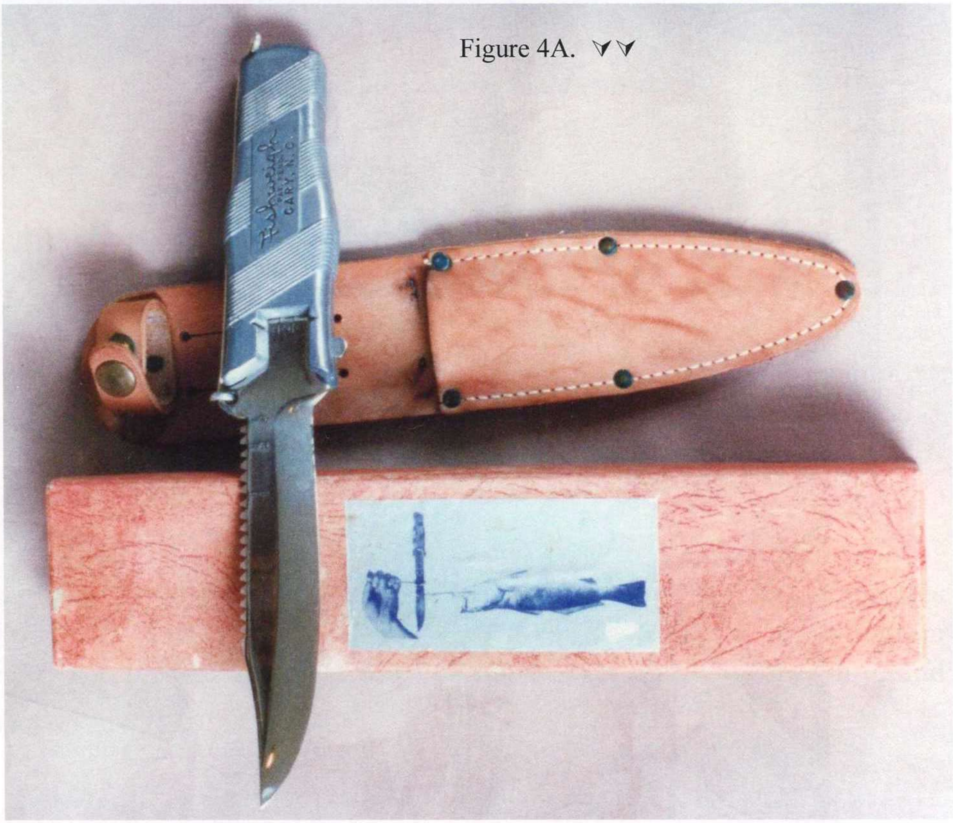


Figure 4A. ⋎⋎

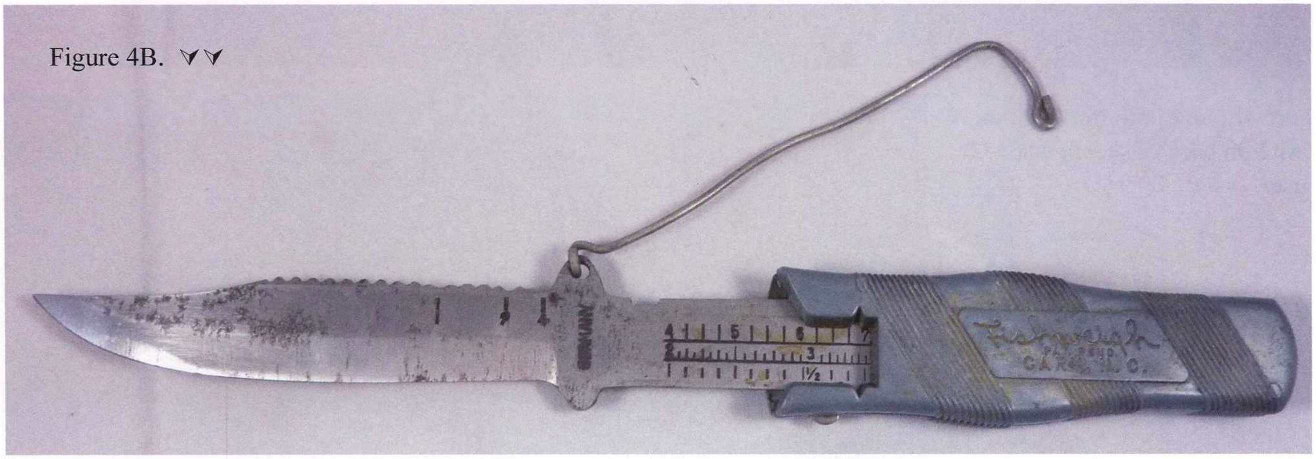


Figure 4B. ⋎⋎

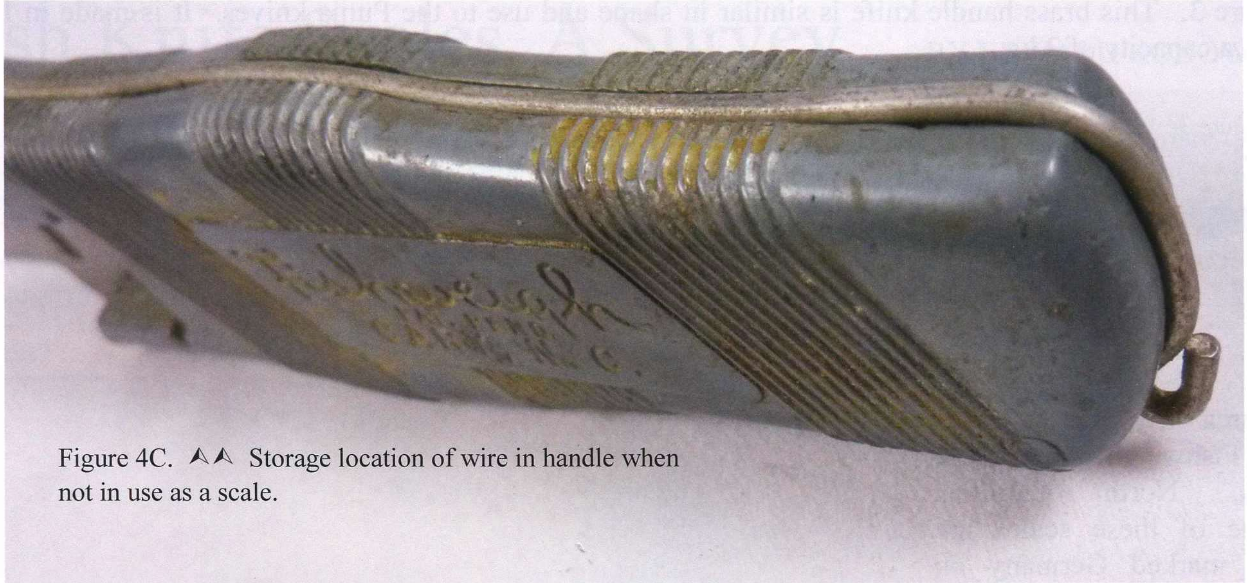


Figure 4C. ⮝⮝ Storage location of wire in handle when not in use as a scale.

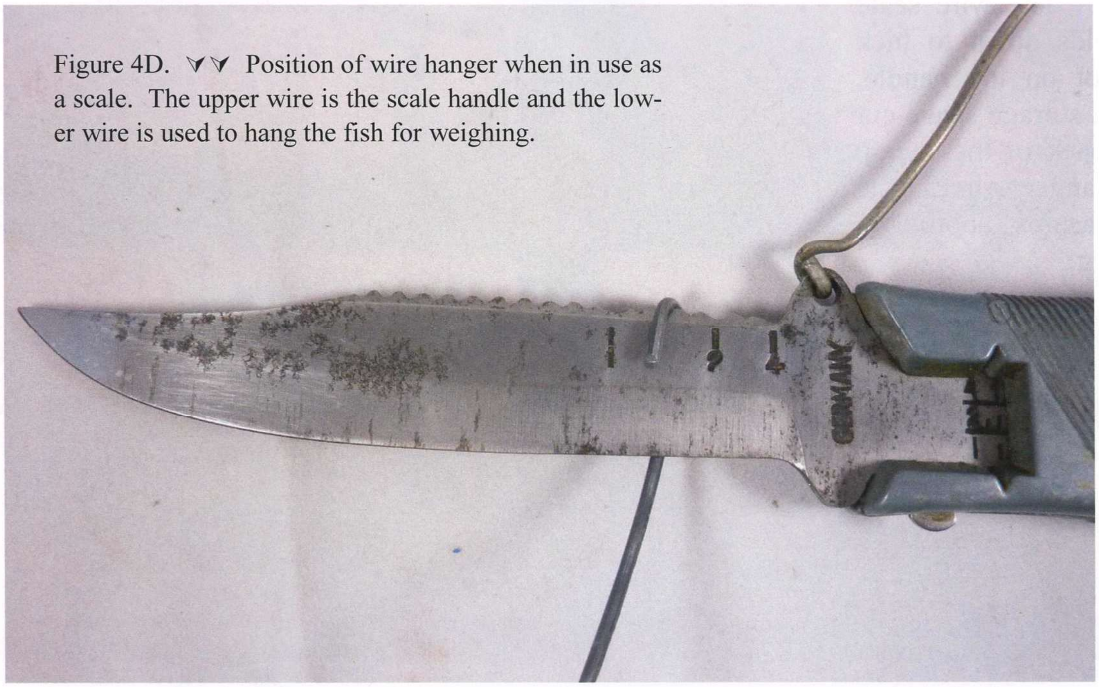


Figure 4D. ⮟⮟ Position of wire hanger when in use as a scale. The upper wire is the scale handle and the lower wire is used to hang the fish for weighing.

Figure 4E. ➢➢ Storage position of wire on back of sheath when not in use.

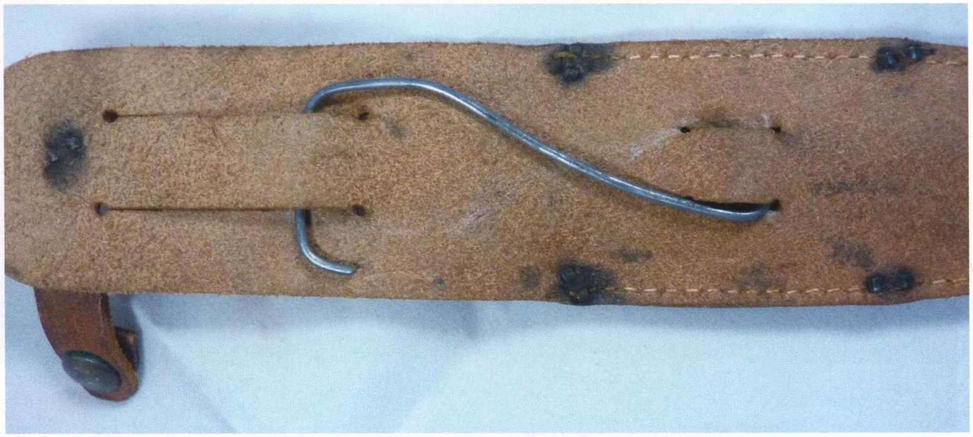


Figure 5. Picam Fish-Mate is a multipurpose tool with a 15 pound or 7 kilogram scale was made in the USA. Also included in this tool: knife, screwdriver, bottle opener, pliers, scaler, and tape measure.

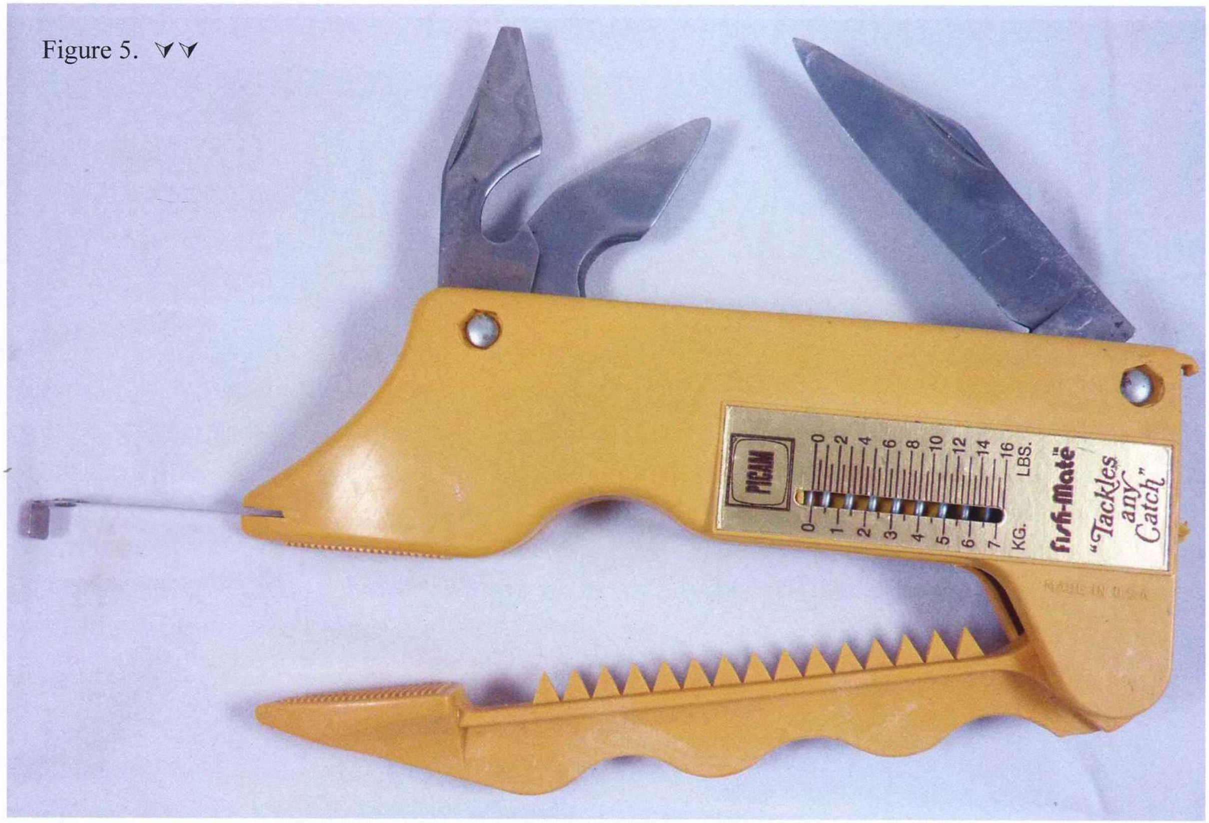


Figure 6. K-tel relied heavily on TV ads to sell records and other household gadgets including this Fishin' Magician, similar in design to the Picam Fish-Mate. It featured a 16 pound or 7 kilogram spring scale, pliers, two knife blades, hook remover, screwdriver, bottle opener, tape measure, and scaler. It is made of plastic.

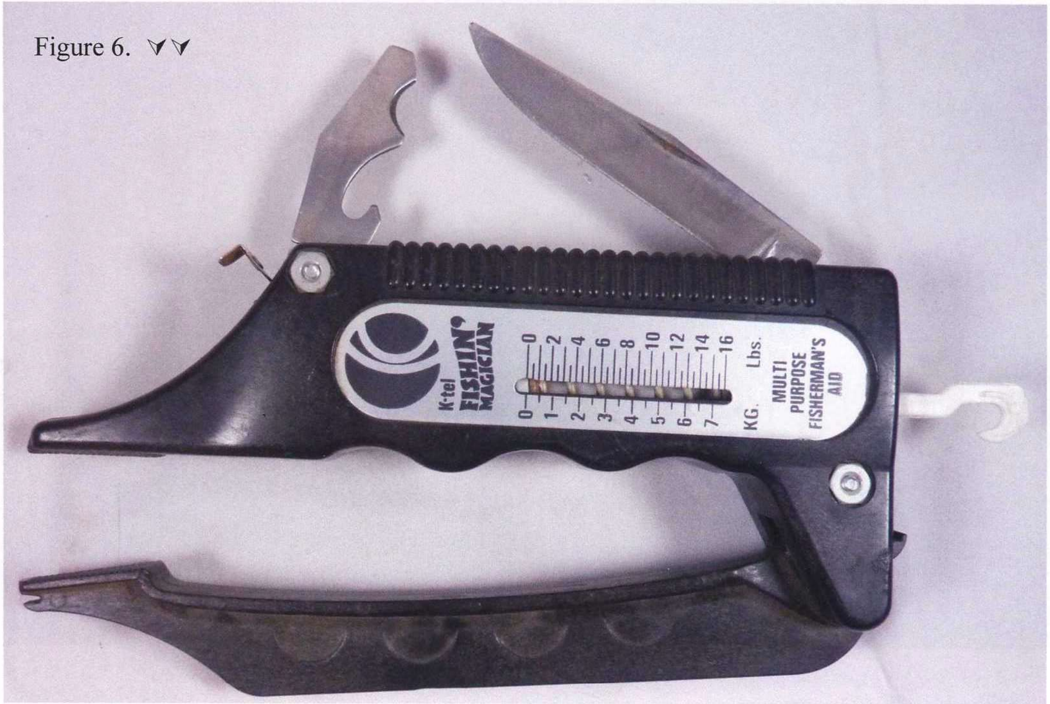


Figure 7A & 7B. The Fisherman's Pride is a well-made German fishing tool which includes pliers, 11 pound or 5 kilogram spring scale, knife, tape measure, and a scaler.

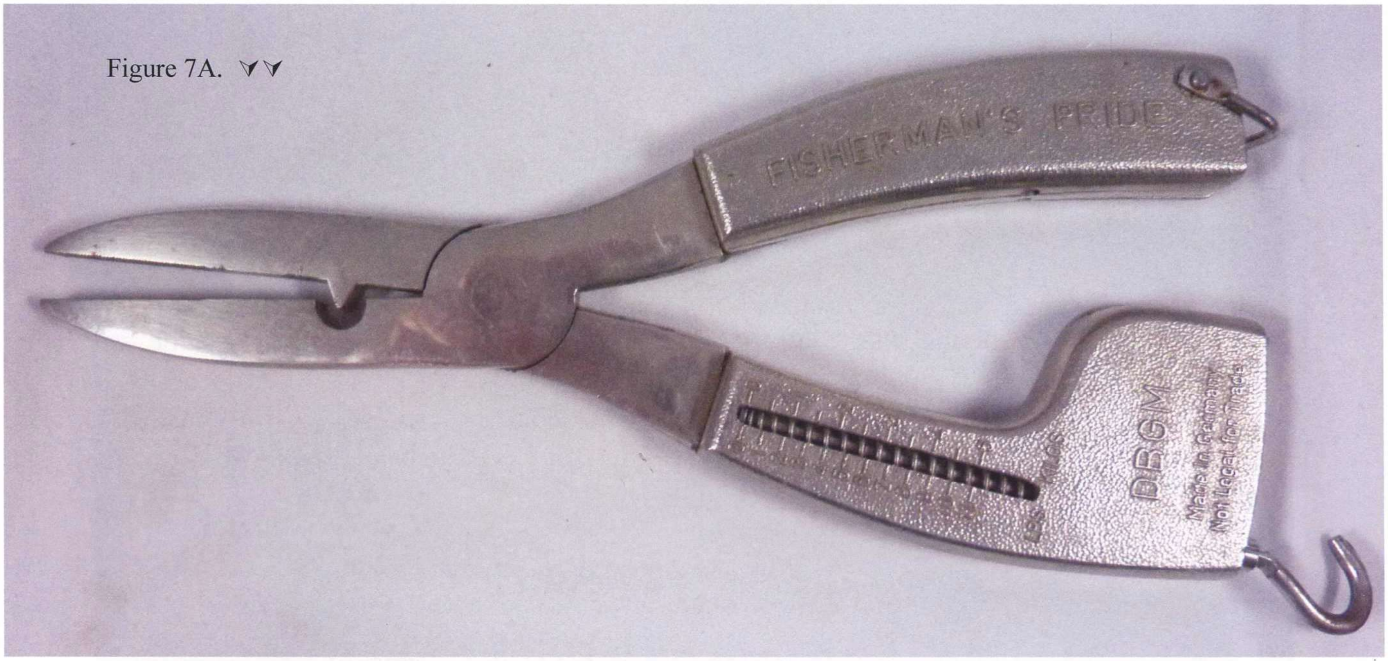


Figure 7A. ⋎⋎

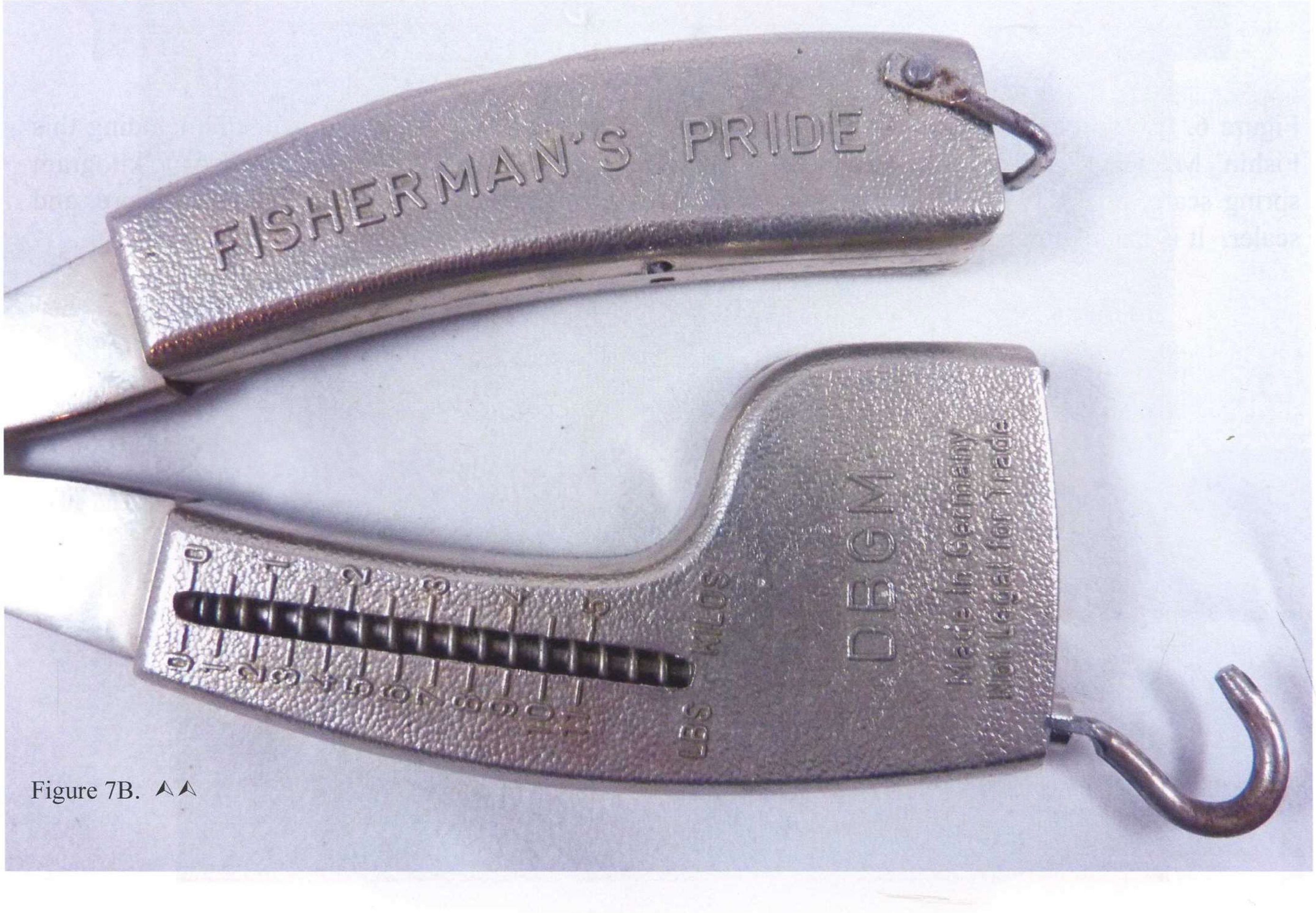


Figure 7B. ⋏⋏

Jenner & Knewstub's Postal Scale

BY DIANA CRAWFORTH-HITCHINS & THE LATE ANDREW CRAWFORTH

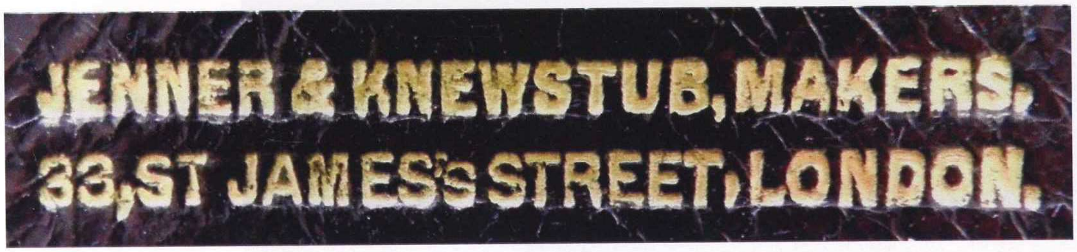


Figure 1. ≺≺

About 30 years ago we were staying with long-time ISASC member Betty Wright, having the time of our lives, allowed to play with any scale, both the smart, ornate ones scattered round the living rooms, and those lined up on the shelves in the basement. Betty mentioned that she had a peculiar scale in her desk drawer that she had never shown us, so we were taken into her office/library. She lifted out a leather case containing a plain brass slab about three inches by six inches, laughing at me when I picked it up and shook it. It was solid. How could it be a scale? I turned it over and over, none the wiser until Andrew pushed the lid away from the slab. The contents were revealed as a mass of brass bits packed in leather purses, lying, some folded, completely filling the box. See Figure 2.

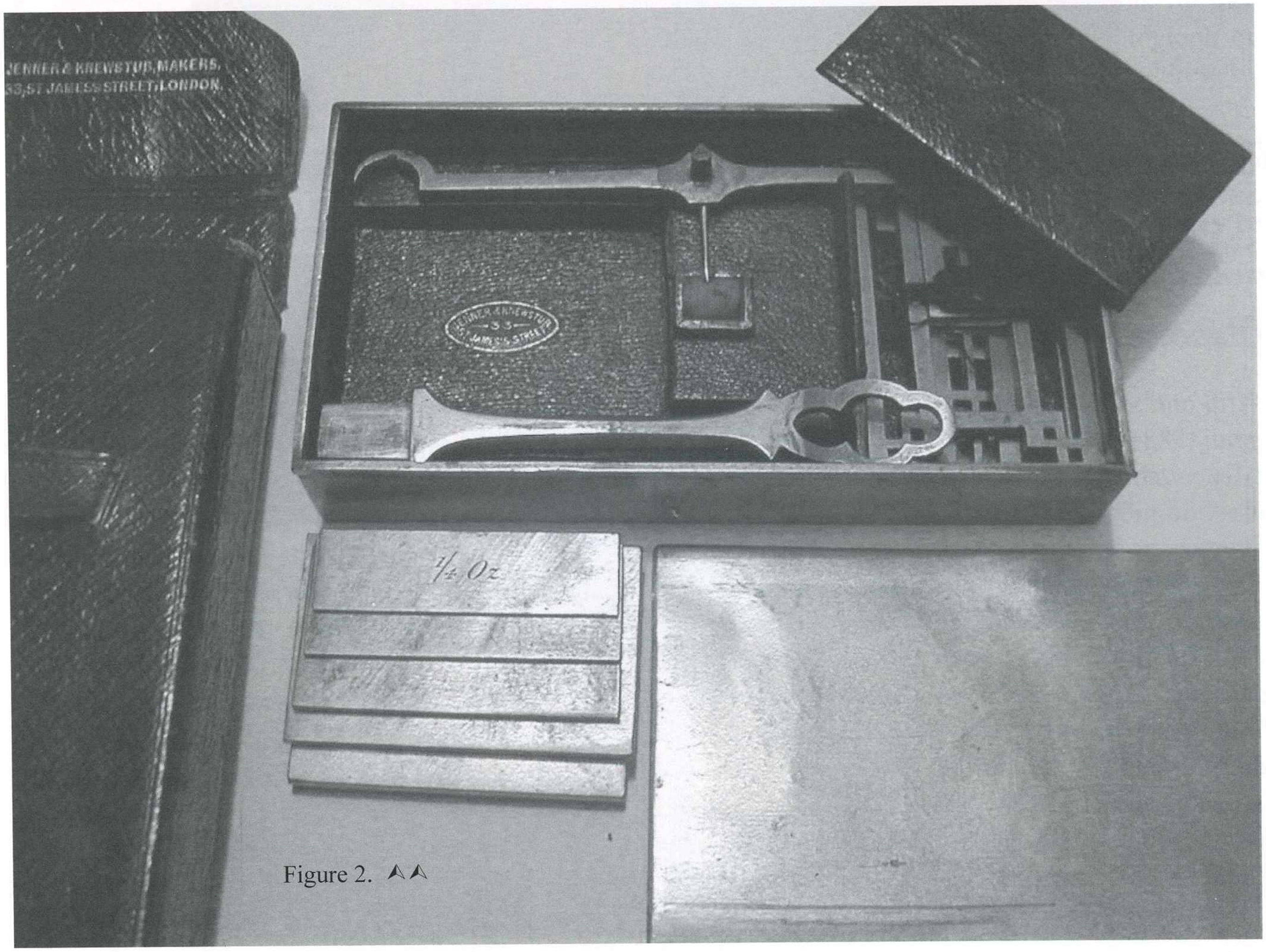


Figure 2. ⋏⋏

Once I had the bits out, I was able to assemble it into this rugged postal scale. See Figure 3. We were thrilled by its unusual design and compact packing. And the flat weights, carefully designed to pack into a small slab, and finely engraved with their weight, were also unusual. See Figure 4.

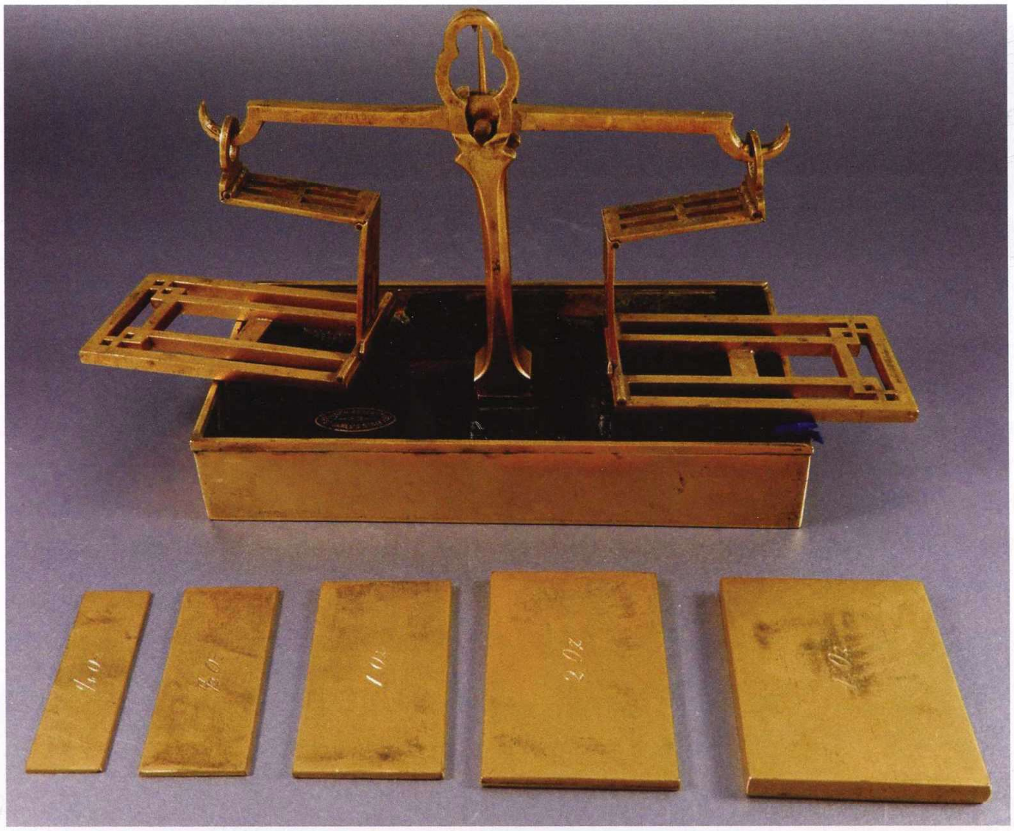


Figure 3. ▲▲

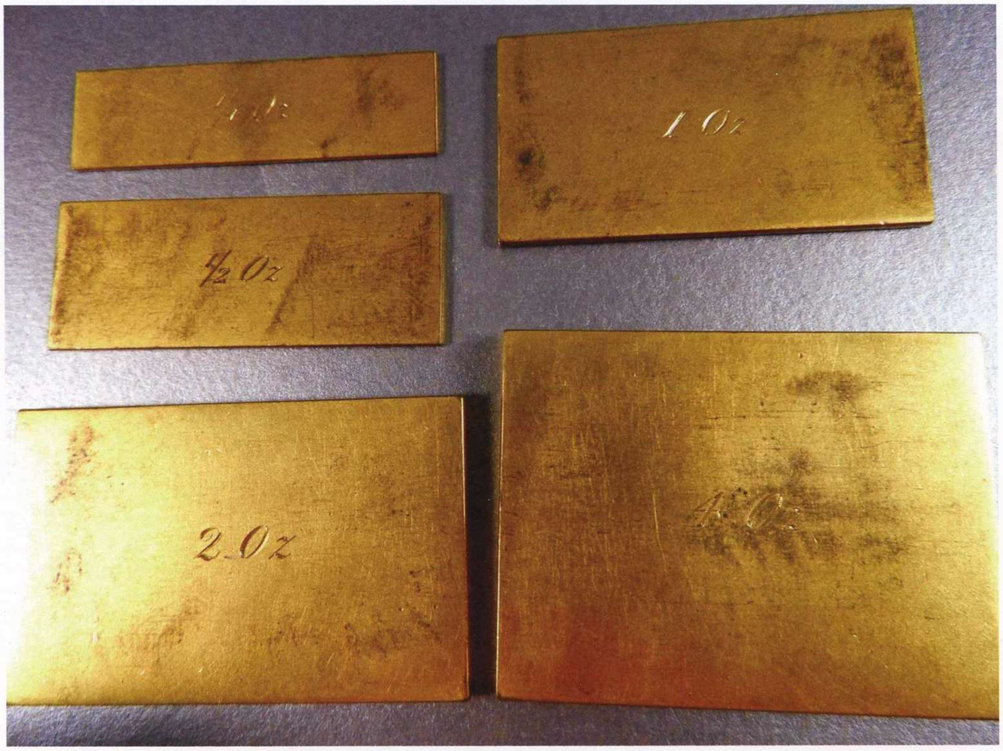


Figure 4. ▲▲

Frederick Jenner & Fabien James Knewstub formed their partnership in 1856 working at 33 St James's Street, London. See Figure 5. In 1862, they developed a second shop at 66 Jermyn St just round the corner if walking on the pavement, but connected if walking through the rear of the shops. They could scarcely have found better-placed shops for the smart, rich ladies and gentlemen that they attracted as customers. Jenner was a stationer, employing 29 men and 16 boys by 1871, and Fabien Knewstub was the jeweller. Shops still restricted their customers to asking for an assistant to show them something they were contemplating buying, and then they could ask the assistant the price. The customers were expected not to touch any of the goods on display so shops employed a huge number of assistants, who were frequently housed in dormitories in the attics of the shops.

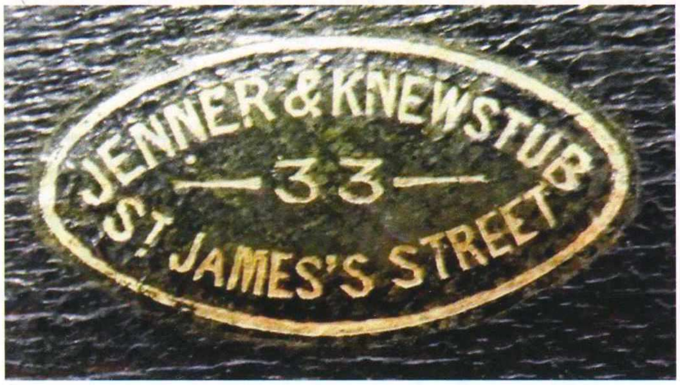
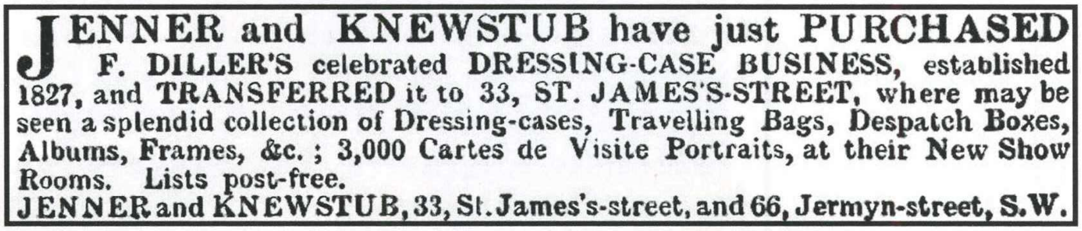


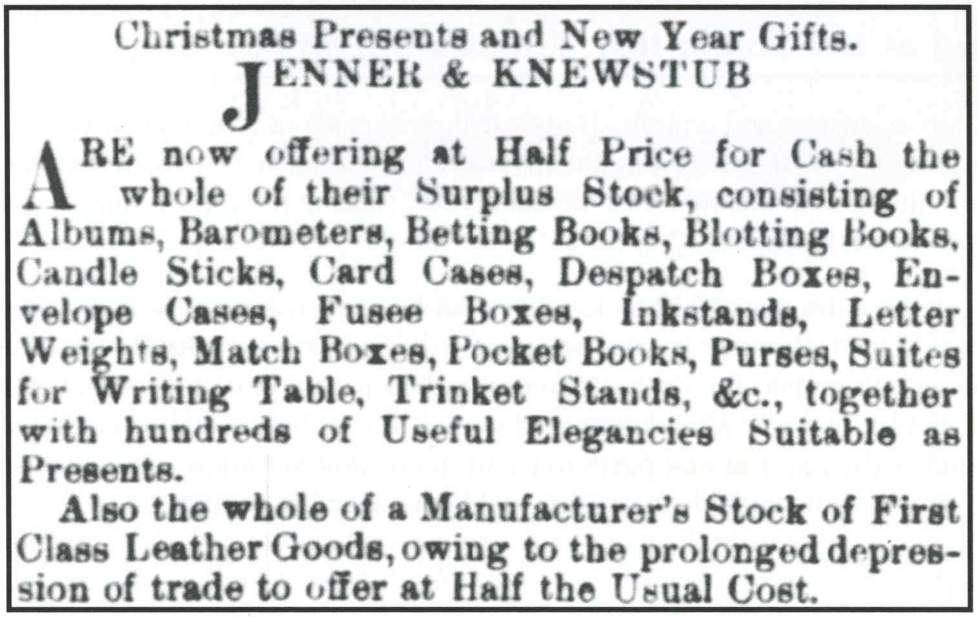
Figure 5. ⮝⮝

The jeweller and the stationer did not have the skills for which Jenner & Knewstub became known. It was only when they bought up a dressing case business that they had the balance of skills needed. See Figure 6. The Victorians had a curious habit of "visiting" a friend's house, not to see their friend, but to leave a Carte de Visite on a tray in the entrance Hall. This indicated that they had thought about their friend but would only stay for afternoon tea on the day specified for that person. The stationers made steady profits by producing personalised Cartes with a photograph on one side and the monogram, name and address on the reverse.

Figure 6. ➢➢



JENNER and KNEWSTUB have just PURCHASED F. DILLER'S celebrated DRESSING-CASE BUSINESS, established 1827, and TRANSFERRED it to 33, ST. JAMES'S-STREET, where may be seen a splendid collection of Dressing-cases, Travelling Bags, Despatch Boxes, Albums, Frames, &c.; 3,000 Cartes de Visite Portraits, at their New Show Rooms. Lists post-free.
JENNER and KNEWSTUB, 33, St. James's-street, and 66, Jermyn-street, S.W.



Christmas Presents and New Year Gifts.

JENNER & KNEWSTUB

ARE now offering at Half Price for Cash the whole of their Surplus Stock, consisting of Albums, Barometers, Betting Books, Blotting Books, Candle Sticks, Card Cases, Despatch Boxes, Envelope Cases, Fusee Boxes, Inkstands, Letter Weights, Match Boxes, Pocket Books, Purses, Suites for Writing Table, Trinket Stands, &c., together with hundreds of Useful Elegancies Suitable as Presents.

Also the whole of a Manufacturer's Stock of First Class Leather Goods, owing to the prolonged depression of trade to offer at Half the Usual Cost.

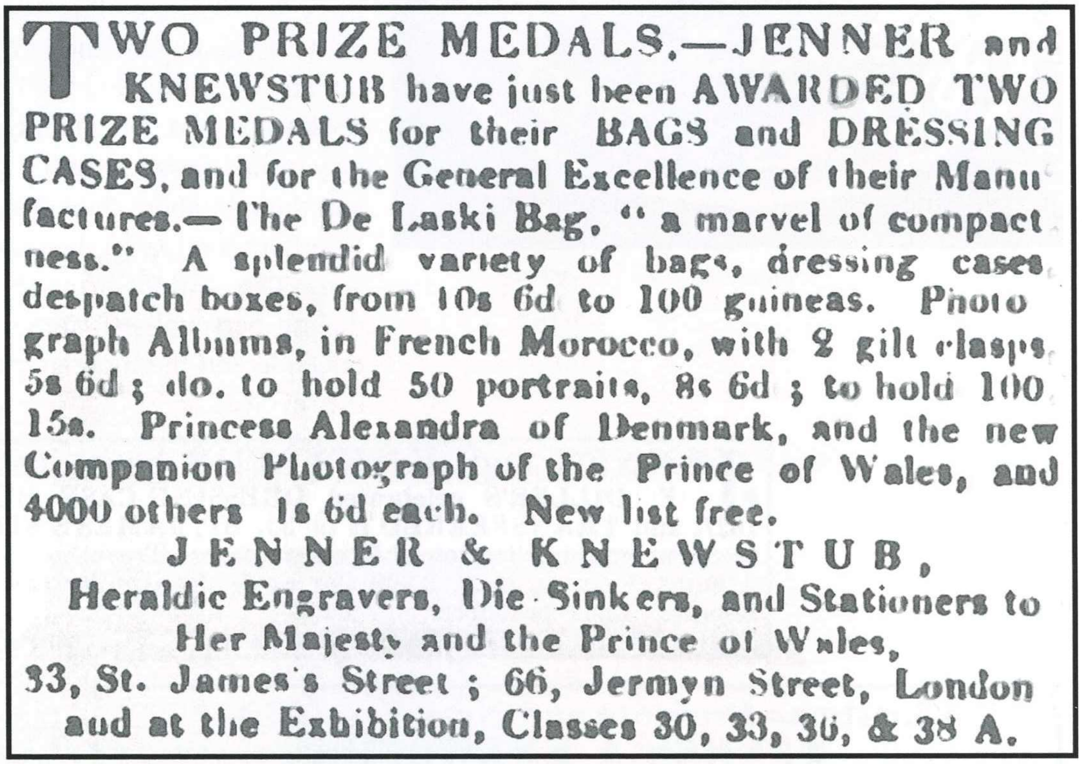
Figure 7. ⮝⮝

The company got into difficulties in about 1882, judging by the dramatic sales they held. See Figure 7. In 1885, their lease expired and new arrangements were forced upon them. They sold off their travelling bags, dressing cases, despatch boxes, and miscellaneous fancy goods in gold, silver, china, bronze and leather goods together with their collection of gem jewellery. It must have been an unusually exotic sale!

The company was liquidated in 1889 and became a Limited Company owned by A Webster & Co. Frederick Jenner set up anew as a leather seller a little further along St James's St.

But how come Jenner & Knewstub made scales? Going back to their early days, in 1862, they were beginning to specialise in leather bag making although they still called themselves "*Heraldic Engravers, Die Sinkers & Stationers*". See Figure 8. They had won medals at the huge 1862 Exhibition in London (not as grand as the 1851 Exhibition, but still prestigious). Their customers included the Queen and her eldest son, the Prince of Wales who both loved going to their private holiday home at Balmoral, Scotland, and who would have found their products very useful, and were not put off by the high prices.. (The photograph of Princess Alexandra referred to Princess Alexandra of Schleswig-Holstein-Sonderburg-Glücksburg who married the Prince of Wales in 1863. For more about her astonishing royal pedigree, Google her.)

Figure 8. ➢➢



TWO PRIZE MEDALS.—JENNER and KNEWSTUB have just been AWARDED TWO PRIZE MEDALS for their BAGS and DRESSING CASES, and for the General Excellence of their Manufactures.—The De Laski Bag, "a marvel of compactness." A splendid variety of bags, dressing cases despatch boxes, from 10s 6d to 100 guineas. Photograph Albums, in French Morocco, with 2 gilt clasps, 5s 6d; do. to hold 50 portraits, 8s 6d; to hold 100 15s. Princess Alexandra of Denmark, and the new Companion Photograph of the Prince of Wales, and 4000 others 1s 6d each. New list free.

JENNER & KNEWSTUB,
Heraldic Engravers, Die-Sinkers, and Stationers to
Her Majesty and the Prince of Wales,
33, St. James's Street; 66, Jermyn Street, London
and at the Exhibition, Classes 30, 33, 36, & 38 A.

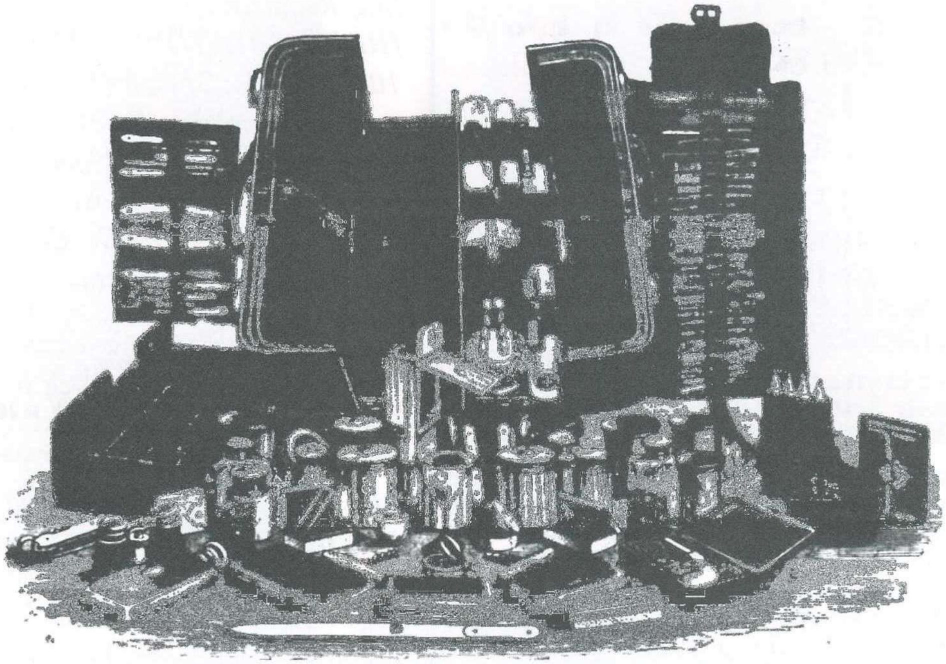
By 1871 they were using gold, silver, enamel and ormolu. Betty's scale was made of ormolu, that is brass that was plated or coated with gold. By 1870, nearly all gold application was achieved by electroplating, because the more luxurious fire-gilding with mercury was too dangerous, causing the early deaths of the workmen breathing in the hot poisonous fumes.

In their adverts in 1871, they offered a discount of 10 to 15% for cash buyers. This hints at their problems with people "putting it on account". In other words, rich people did not pay immediately for their purchases, but allowed the bill to accumulate for several purchases, then paid a large bill, sometimes years after they had bought the goods. The poor shop-keeper had to trust that the bill would be honoured eventually, so instead of taking the slow payer or non-payer to Court, they allowed him to continue buying their goods and prayed that he was an honourable man who would not die before paying.

By 1872, they were making their Elgin Writing Case, no doubt named by a man who loved his whisky. Here is a sixth of the fulsome advert. "*By Two Special Appointments to the Queen and all the Royal Family, Invented, manufactured and sold by Jenner & Knewstub, The Elgin Writing case from its compactness, lightness and comprehensiveness, supersedes the ordinary despatch-boxes and desks in travelling. It is so constructed that it can be expanded 4, 5, 8, 10 and 12 inches (according to sizes) and contracted at pleasure. The Elgin Writing Case possesses all the advantages of the Despatch box, being at the same time only one-third its weight and size. For travelling or campaigning it has been pronounced the best Writing Case ever invented.*" Andrew liked to think of Queen Victoria sitting on a train with her Elgin Writing Case beside her while she worked through the State Papers she had to study every day. I think of an Army Officer stationed in India making sure his servants packed his Elgin Writing Case on the elephant taking him up country to control a million Indians and their bullied and intimidated Maharajah. (Campaigning was most frequently Army Officers travelling in areas without roads, taking their folding furniture with them.)

The Elgin was the most modest of their bags. The big one, "The Bag of Bags" that they patented and first sold in 1872, a wonderful bag or compendium, filled with every implement and necessity for the richest travellers, was a stunning £100 in its most luxurious version. That is equivalent to £66,730 today. Well, if the purchaser owned a few coal-mines, he could afford to pop down to London and buy a few treats. I could not find a clear picture of the Bag of Bags, but even this black version gives some idea of its complexity. See Figure 9. Surely the scale is somewhere in there?

Figure 9. ➢➢

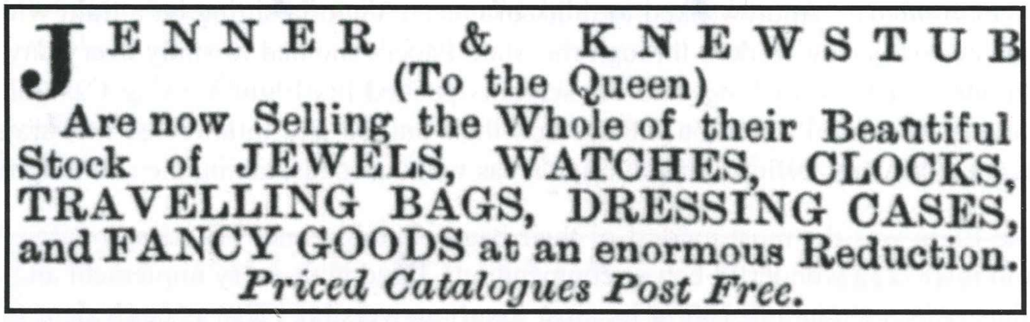


Monograms in Gold, Silver, &c., Engraved, Inlaid, Enamelled, Carved, &c., on Dressing Case Fittings, &c.
NEW DESIGNS FOR ALL KINDS OF ARTISTIC WORK FURNISHED TO ORDER.

There was no advertisement specifically for their scales but we can make a good guess. In 1882 they had big adverts placed in newspapers all over the country, and even in Scotland, for their "Bag of Bags". In order to include so many pieces, they designed every piece to be as compact as possible and the price increased to a maximum of £200. The things with spikes were slipped into purses, wallets or leather boxes, the bigger pieces were strapped into middling sized bags, and everything was packed into the "Bag of Bags". Of course Betty's compact scale (or letter weight, as Jenner & Knewstub called it) packed so neatly into its brass box and protected by its leather slip-case, was supplied in all three versions of their bag, the Bag of Bags, the Patent Dispatch Box, and the Elgin Writing Case. It was available as a separate piece, offered as a perfect Christmas present. See Figure 7. I guess most ISASC members would be very happy to receive one!

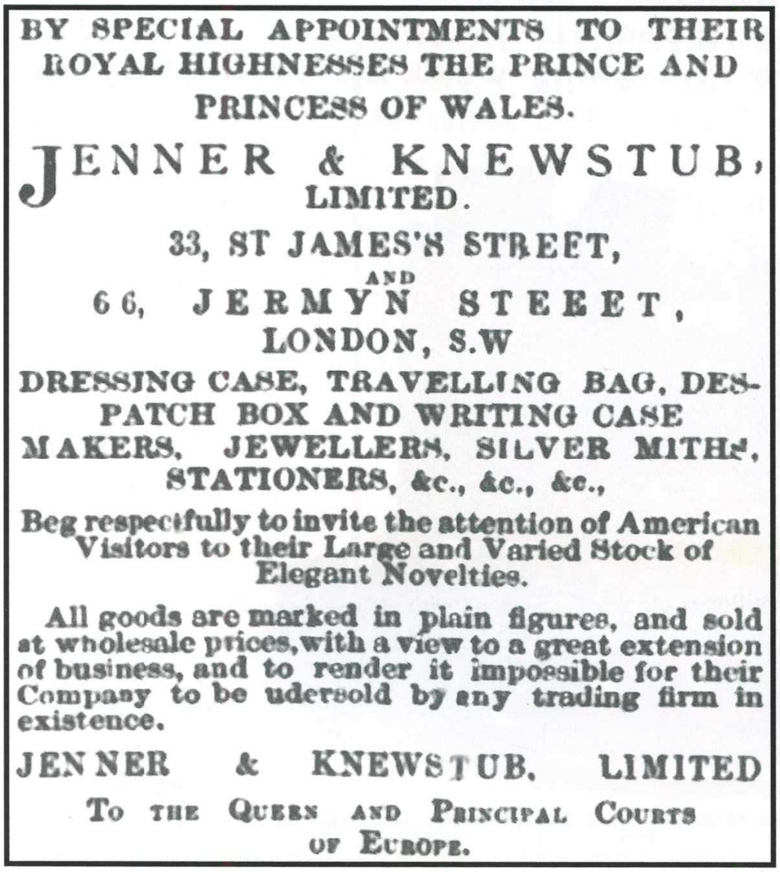
Although it is immoral for a few rich customers to spend so much on elegancies, it is still sad to see the end of a company run by men who prided themselves on making the most fabulous cases of implements. See Figure 10. Then they were inspired - tempt the Americans to buy their elegant novelties - emphasise that the Royalty of the Kingdoms in Europe and the Prince & Princess of Wales bought their products. They would soon be King and Queen of Great Britain. What better recommendation could be given? See Figure 11. Jenner & Knewstub were updating their method of selling. They put the price on the articles, so that the customers could start to make decisions before taking up the attention of an assistant.

Figure 10. ➢➢



JENNER & KNEWSTUB
(To the Queen)
Are now Selling the Whole of their Beautiful Stock of JEWELS, WATCHES, CLOCKS, TRAVELLING BAGS, DRESSING CASES, and FANCY GOODS at an enormous Reduction.
Priced Catalogues Post Free.

Figure 11. ⋎⋎



BY SPECIAL APPOINTMENTS TO THEIR ROYAL HIGHNESSES THE PRINCE AND PRINCESS OF WALES.

JENNER & KNEWSTUB,
LIMITED.
33, ST JAMES'S STREET,
AND
66, JERMYN STEEET,
LONDON, S.W

DRESSING CASE, TRAVELLING BAG, DESPATCH BOX AND WRITING CASE MAKERS, JEWELLERS, SILVER MITHS, STATIONERS, &c., &c., &c.,

Beg respectfully to invite the attention of American Visitors to their Large and Varied Stock of Elegant Novelties.

All goods are marked in plain figures, and sold at wholesale prices, with a view to a great extension of business, and to render it impossible for their Company to be udersold by any trading firm in existence.

JENNER & KNEWSTUB, LIMITED
To the Queen and Principal Courts of Europe.

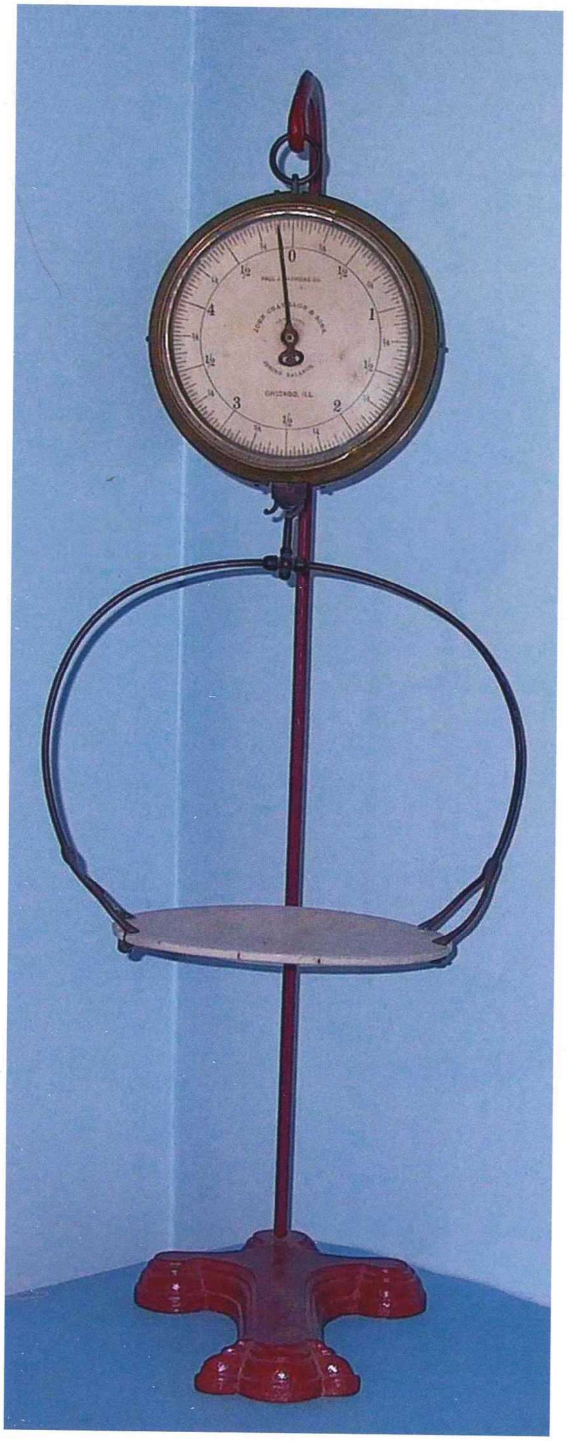
But it didn't work. They went bankrupt in 1890. and Goff's were the beneficiaries. " *Before you travel, go to Goff's - The largest stock of Travelling Requisites in London - A useful size COWHIDE GLADSTONE BAG or PORTMANTEAU 10s, 12s, 15s; 30inch Dress Basket, 24s. Now on sale, the Bankrupt Stock of Knewstub & Jenner, comprising valuable dressing bags, steamer trunks, hat & bonnet boxes, etc at 50% reductions at S Goff's, 17 King St, Covent Garden.*" Were compact postal scales travelling requisites?

Fortunately, they were a Limited company when they went bankrupt, so their private dwellings and contents were not subject to distraint. Adverts in the London newspapers offer " *FORTHCOMING AUCTION on Jan 14th 1890, Re JENNER & KNEWSTUB LTD of 33 St James's & 55 Jermyn St - By order of the Receiver, the long leases at low rentals of these elegantly placed business premises, occupying commanding positions in the leading West End thoroughfares, together with the valuable house & shop fittings, with possession. The premises communicate and form a spacious business establishment, but can readily be subdivided. All at upward price of £6000.*" That's the equivalent of £4,424,000 today which sounds wonderful until they deduct whatever they owe.

After Andrew and I had found out all we could, we wondered whether it would be too impudent to write to the Queen to ask her whether she had inherited a Bag of Bags from her great-great-grandmother Queen Victoria. and if so, does she have a Jenner and Knewstub postal scale?

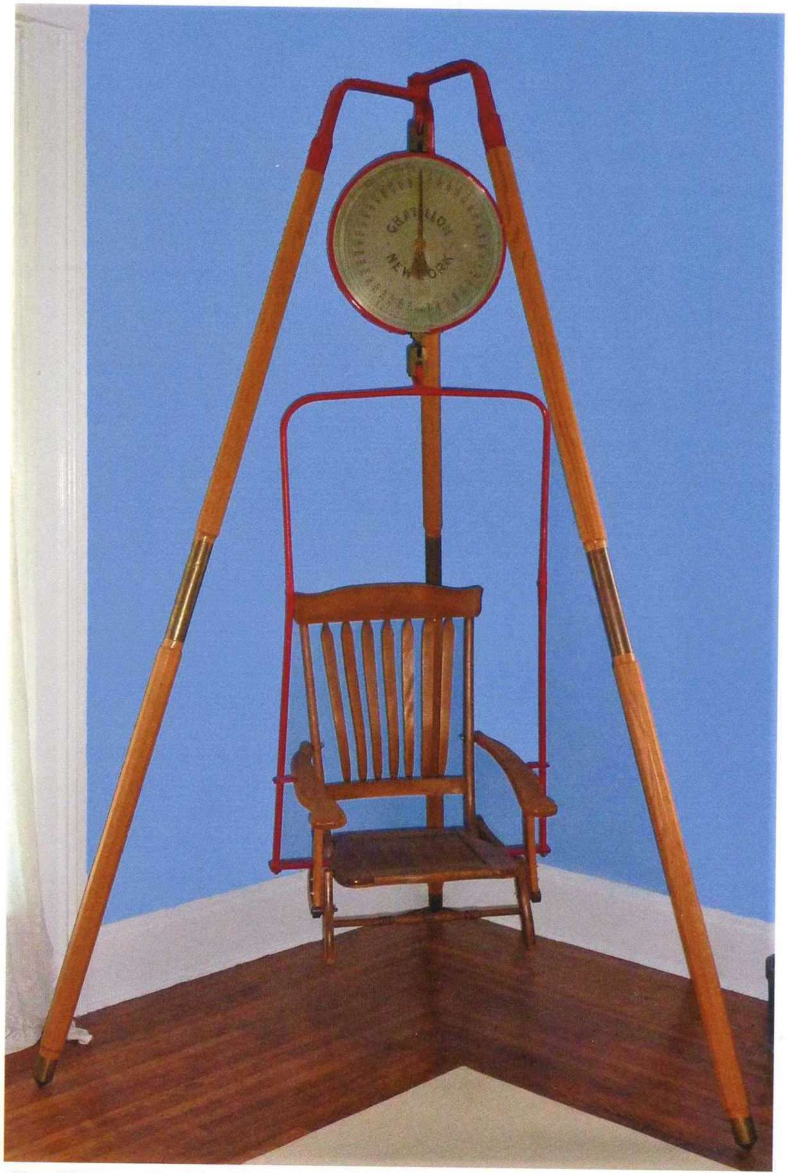
We have the benefit of Betty's skill in collecting rare scales. If you visit the ISASC Museum, you too can enjoy the Jenner and Knewstub postal scale donated by Betty and Frank Wright.

Showcase



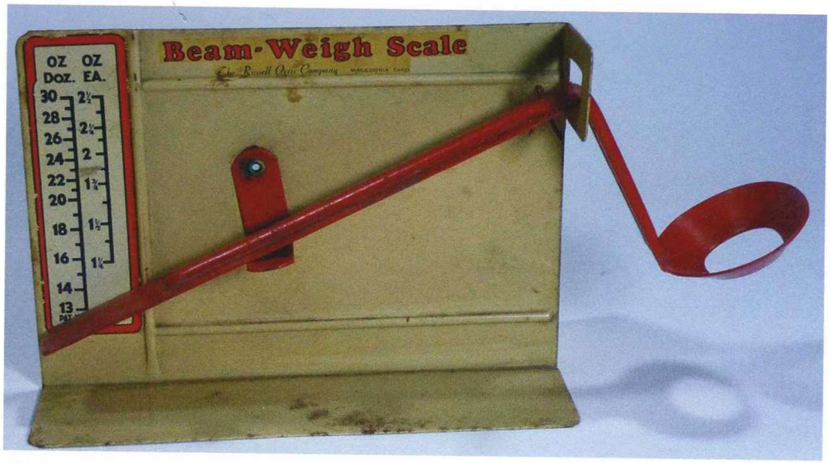
Chatillon made this hanging spring balance. A two sided glass face with a hanging porcelain pan, with brass bail and an original Chatillon stand that was pictured in their 1900 and 1921 catalogs was found in a Chicago Fish Market.

Berning Collection.

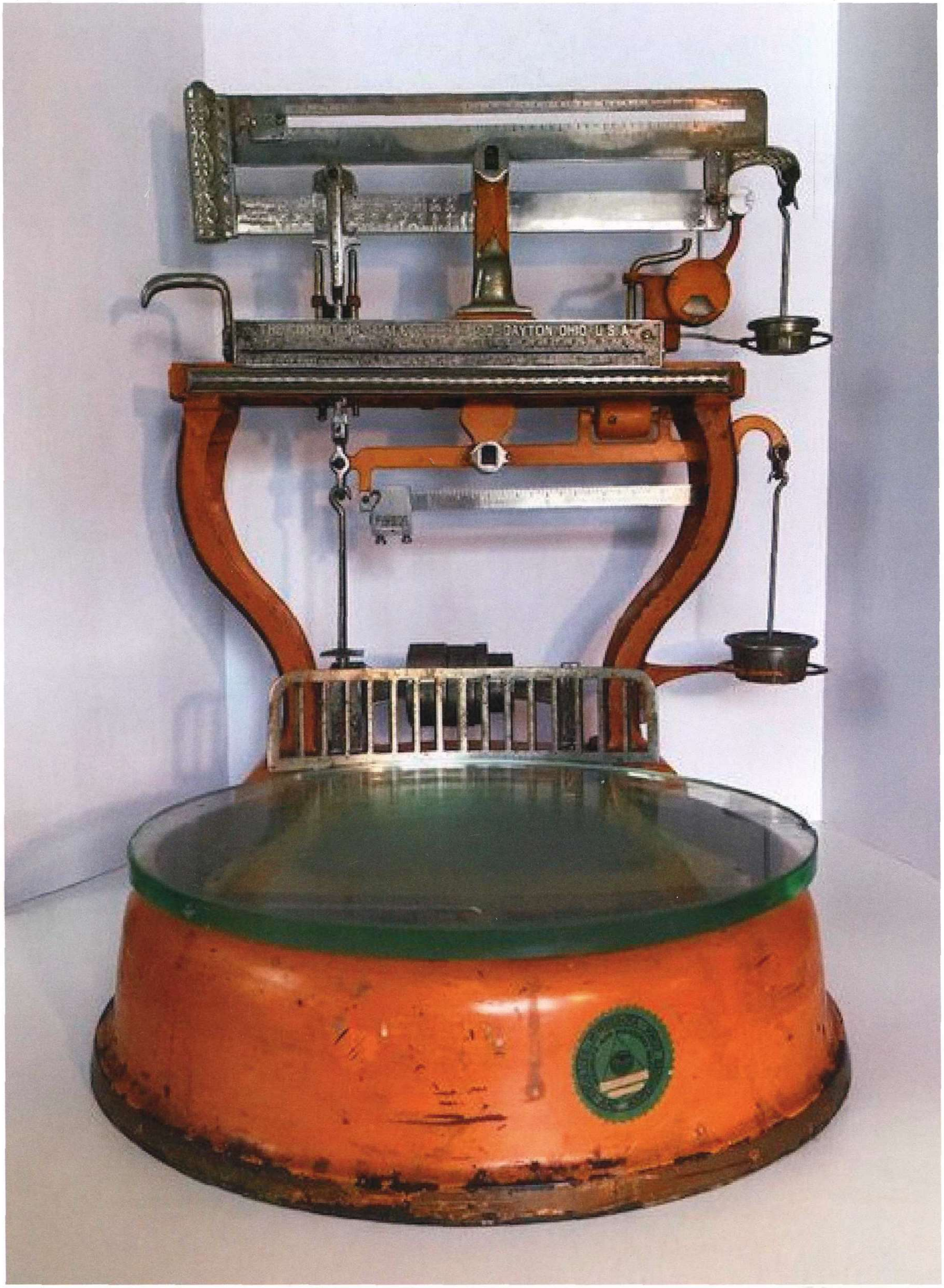


Chatillon made this Chair Scale with different style chairs from 1894 to 1921. This one came with a sign for a carnival guess your weight booth.

Berning collection.



This Beam Weigh Scale is a red and white tin egg grader made by Russell Orris Co. in Macedonia, OH. Patent 2,056,997 of 1936.Jibben Collection.



This Dayton Moneyweight Computing Scale was found a couple of days before publication. It has original paint and other features. It has a ring gear on a circular track in base which allows rotating. It is complete with a full set of original computing weights. Fred Rengel Collection.